KUMARAGURU COLLEGE OF TECHNOLOGY

COIMBATORE

CURRICULUM & SYLLABUS

(REGULATIONS 2009)

(I - VI Semester & Electives)

MCA PROGRAMME

KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE-49

(An Autonomous College Affiliated to Anna University, Coimbatore.)

M.C.A
(Total Credits – 118)

SEMESTER – I

Code No.	Course Title	L	T	P	C
Theory					
MCA501	Computer Organization	3	0	0	3
MCA502	Problem Solving and Programming	3	1	0	4
MCA503	Business Processes	3	0	0	3
MCA504	Data Structures	3	1	0	4
MCA505	Accounting and Financial Management	3	1	0	4
Practical					
MCA701	Programming Lab	0	0	3	1
MCA702	Data Structures Lab	0	0	6	2

Total Credits: 21

SEMESTER – II

Code No.	Course Title	L	T	P	C
Theory					
MAT509	Mathematical Foundations of Computer Science	3	1	0	4
MCA506	Object Oriented Programming	3	0	0	3
MCA507	Design and Analysis of Algorithms	3	1	0	4
MCA508	Database Management Systems	3	0	0	3
MCA509	Operating Systems	3	0	0	3
Practical					
MCA703	Object Oriented Programming Lab	0	0	3	1
MCA704	Algorithms Lab	0	0	3	1
MCA705	DBMS Lab	0	0	3	1

Total Credits: 20

SEMESTER – III

Code No.	Course Title	L	T	P	C
Theory					
MCA510	Computer Networks	3	0	0	3
MCA511	Microprocessors and its Applications	3	1	0	4
MCA512	Software Engineering	3	0	0	3
MCA513	Computer Graphics and Multimedia Systems	3	1	0	4
MCA514	Internet Programming	3	0	0	3
Practical					
MCA706	Microprocessor Lab	0	0	3	1
MCA707	Graphics and Multimedia Lab	0	0	3	1
MCA708	Internet Programming Lab	0	0	3	1
MCA709	Mini Project – I	0	0	2	1
MCA710	Technical Seminar I	0	0	2	1

Total Credits: 22

SEMESTER – IV

Code No.	Course Title	L	T	P	C
Theory					
MCA515	UNIX and Network Programming	3	0	0	3
MAT510	Resource Management Techniques	3	1	0	4
E1***	Elective I	3	0	0	3
MCA516	Object Oriented Analysis and Design	3	0	0	3
MCA517	Middle-Ware Technologies	3	0	0	3
Practical					
MCA711	Visual Programming Lab	2	0	3	3
MCA712	Unix and Network Programming Lab	0	0	3	1
MCA713	Middleware Lab	0	0	3	1
ENG701	Communication Skills	0	0	2	1
MCA714	Technical Seminar II	0	0	2	1

Total Credits: 23

SEMESTER – V

Code No.	Course Title	L	T	P	C
Theory					
MCA518	XML and Web Services	3	0	0	3
MCA519	Software Project Management	3	0	0	3
E2***	Elective II	3	0	0	3
E3***	Elective III	3	0	0	3
E4***	Elective IV	3	0	0	3
Practical					
MCA715	XML and Web Services Lab	0	0	3	1
MCA716	Software Development Lab	0	0	6	2
MCA717	Mini Project – II	0	0	2	1
ENG702	Technical Writing Skills	0	0	2	1

Total Credits: 20

SEMESTER – VI

Code No.	Course Title	L	T	P	C
Practical					
MCA718	Project Work	0	0	24	12

Total Credits: 12

LIST OF ELECTIVES
DEPARTMENTAL ELECTIVES

Code No.	Course Title	L	T	P	C
MCA520	Electronic Commerce	3	0	0	3
MCA521	Management Information Systems	3	0	0	3
MCA522	Web Graphics	3	0	0	3
MCA523	Human Resource Management	3	0	0	3
MCA524	Advanced DBMS	3	0	0	3
MCA525	Software Quality Management	3	0	0	3
MCA526	TCP/IP Protocol Suite	3	0	0	3
MCA527	Distributed Computing	3	0	0	3
MCA528	Data Warehousing and Data Mining	3	0	0	3
MCA529	Component Based Technologies	3	0	0	3
MCA530	Mobile Computing	3	0	0	3
MCA531	Digital Image Processing	3	0	0	3
MCA532	Enterprise Resource Planning	3	0	0	3
MCA533	Agent Based Intelligent System	3	0	0	3
MCA534	Natural Language Processing	3	0	0	3
MCA535	Software Agents	3	0	0	3
MCA536	Healthcare Systems	3	0	0	3
MCA537	Unix Internals	3	0	0	3
MCA538	Business Intelligence	3	0	0	3
MCA539	Managerial Economics	3	0	0	3
MCA540	Supply Chain Management	3	0	0	3
MCA541	Portfolio Management	3	0	0	3
MCA542	Cloud computing	3	0	0	3
MCA543	Software reliability and metrics	3	0	0	3

LIST OF ELECTIVES OFFERED BY OTHER DEPARTMENT

Code No.	Course Title	L	T	P	C	Department
MAT511	Numerical Methods	3	1	0	4	Maths
MAT512	Statistical Methods	3	1	0	4	Maths

Subjects	Credits
Core	**80**
Elective	**12**
Maths	**8**
Value Added	**04**
Mini Projects	**02**
Major Project	**12**
Total	**118**

SEMESTER - I

MCA501 COMPUTER ORGANIZATION 3 0 0 3

1. INTRODUCTION TO DIGITAL DESIGN 9

Data Representation – Data Types – Complements – Arithmetic Operations – Representations – Fixed –Point, Floating – Point , Decimal Fixed – Point – Binary Codes- Logic Gates, Boolean Algebra, Map Simplification – Combinational Circuits: Half-Adder, Full Adder- Flip Flops - Sequential Circuits

2. DIGITAL COMPONENTS - REGISTER TRANSFER & MICRO OPERATIONS 9

ICs – Decoders – Multiplexers – Registers – Shift Registers – Binary Counters – Memory Unit – Register Transfer Language – Register Transfer – Bus And Memory Transfers – Arithmetic, Logic And Shift Micro Operations , Arithmetic Logic Shift Unit.

3. COMPUTER ORGANIZATION AND PROGRAMMING 9

Instruction Codes – Computer Registers – Computer Instructions – Timing And Control – Instruction Cycle – Memory Reference Instructions – I/O And Interrupt – Machine Language – Assembly Language – Assembler - Program Loops – Programming Arithmetic And Logic Operations – Subroutines – I/O Programming.

4. INPUT – OUTPUT ORGANIZATION 9

Peripheral Devices – Input-Output Interface – Asynchronous Data Transfer – Modes Of Transfer – Priority Interrupt – DMA – IOP – Serial Communication.

5. MEMORY ORGANIZATION AND CPU 9

Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory– CPU: General Register Organization – Control Word– Instruction Format – Addressing Modes – Data Transfer And Manipulation – Program Control.

Total No. of Periods: 45

TEXTBOOK

1. M.Morris Mano,"Computer System Architecture",Prentice Hall of India, 2001.

REFERNCES

1. John .p.Hayes,"Computer Architecture and Organization", Tata McGraw Hill, 1996.
2. V.C.Hamatcher,et al "Computer Organization", Tata Mcgraw Hill,1996

MCA502 PROBLEM SOLVING AND PROGRAMMING 3 1 0 4

1. INTRODUCTION TO COMPUTER PROBLEM SOLVING 9

Introduction – The Problem Solving aspect – Top down Design – Implementation of Algorithms – Program Verification – Efficiency of Algorithms – Analysis of Algorithms

2. FUNDAMENTAL ALGORITHMS 9

Introduction – Exchanging the values – Counting – Factorial Computation – SINE computation – Base Conversion – Factoring Methods – The smallest divisor of an integer – The GCD of two integers – Raising a number to a large power - Array Techniques- array order traversal – Finding the maximum number in a set – Removal of duplicates from an ordered array.

3. INTRODUCTION TO C LANGUAGE 9

Overview of C – Constants, Variables and Data Types – Operators and Expressions – Managing Input/Output Operations – Formatted I/O – Decision Making - Branching –- IF, Nested IF – Switch – go to - Looping- While, do, for statements.

4. ARRAYS, FUNCTIONS, STRUCTURES AND UNIONS 9

Arrays – dynamic and multi-dimensional arrays - Character arrays and Strings – String handling Functions - User defined Functions – Categories of Functions – Recursion - Structures and Unions – Array of Structures – Structures and Functions

5. POINTERS AND FILE MANAGEMENT 9

Pointers – Declaration, Accessing a variable, character strings, pointers to functions and structures - File Management in C – Dynamic Memory allocation – Linked Lists – Preprocessors.

L 45 T 15 Total No. of periods: 60

TEXTBOOK

1. R.G.Dromey " How to Solve it by Computer ", PHI , 1998
2. E.Balagurusamy " Programming in ANSI C " , Tata McGraw Hill, 2004

REFERNCES

1. Deitel and Deitel " C How to Program ", Addisson Wesley , 2001
2. Brian W.Kernighan & Dennis Ritchie "C Programming Language", PHI, 1990
3. Byron.S.Gottfried "Schaum's Outline of Programming with C ", 2nd Edition,1996

MCA503 BUSINESS PROCESSES 3 0 0 3

1. ORGANIZATIONAL STRUCTURE 9

Types of Business Organizations-Organizational Structures-Definition-Complexity-Formulization-Size-Technology-Culture-Forms and Outcomes-Explanations of Structures-IT Industry and Organizational Structures-Case Studies

2. ORGANIZATIONAL OUTCOMES 9

Organizational Power and Power Outcomes-Leadership and Decision Making-Communication and Organizational Change-Organizational Environments and Effects- -Organizational Effectiveness-Case Studies

3. BUSINESS PROCESS RE-ENGINEERING 9

Introduction to Business Process Re-engineering (BPR)-Meaning-Types-Process-Impetrative for Survival-Strategic Approach-Implementing Business Process Re-engineering-Methodology and Steps-Indian Scenario of Implementing BPR-Case Studies

4. BPR AND IT INDUSTRY 9

BPR and Information Technology Process-People View and Perspectives-Empowering People through IT-Managing Change in the Global Environment-BPR Rediscovering Indian Paradigm-Need of Reengineering-Case Studies

5. E-BUSINESS PROCESS 9

E-Business-Introduction-E-business vs. E-commerce- E-business design-Trends- -Constructing E-business Architecture- E-business Application Areas(CRM,ERP,SCM and Selling)-E-business and India-Case Studies

Total No. of Periods: 45

TEXTBOOK

1. Richard H.Hall, Organizations-Structures, Processes and Outcomes", Pearson Education, 2004
2. M.S.Jayaraman et. Al, "Business Process Reengineering", Tata Mc Graw Hill Publications, 2001
3. Ravi Kalakota and Marcia Robinson, "E-Business; Roadmap for Success; Pearson Education, 2000

REFERNCES

1. Gareth Jones, "Organizational Theory, Design and Change", Pearson Education, 4th Edition, 2004
2. Dave Chaffey, "E-business and E-Commerce" Pearson Education, 2nd Edition,2003

MCA504 DATA STRUCTURES 3 1 0 4

1. INTRODUCTION 9

Introduction – Arrays – Structures – Stack: Definition and examples, Representing Stacks - Queues and lists: Queue and its Representation, lists – Applications of Stack, Queue and Linked Lists.

2. TREES 9

Binary Trees – Operations on binary trees - Binary Tree Representations – node representation, internal and external nodes, implicit array representation – Binary tree Traversals - Huffman Algorithm – Representing Lists as Binary Trees

3. SORTING AND SEARCHING 9

General Background – Exchange sorts – Selection and Tree Sorting – Insertion Sorts – Merge and Radix Sorts – Basic Search Techniques – Tree Searching – General Search Trees – Hashing.

4. GRAPHS AND THEIR APPLICATIONS 9

Graphs – An application of graphs – Representation – transitive closure - Warshall's algorithm – Shortest path algorithm - a flow Problem – Dijkstra's algorithm – An application of scheduling - Linked representation of Graphs – Graph Traversals

5. STORAGE MANAGEMENT 9

General Lists: Operations, linked list representation, using lists, Freeing list nodes - Automatic list Management: Reference count method, Garbage Collection, Algorithms, Collection and compaction

L 45 T 15 Total No. of periods: 60

TEXTBOOK

1. Tanaenbaum, A.M.,Langsam Y, Augestein M.J " Data Structures using C" Pearson Education , 2004

REFERNCES

1. Robert Kruse & Clovis L. Tondo " Data Structures and Program Design in C"**,**Prentice Hall , 2nd edition.,1991.
2. Weiss "Data Structures and Algorithm Analysis in C " ,Addison Wesley , Second Edition, 1997.

MCA505 ACCOUNTING AND FINANCIAL MANAGEMENT 3 1 0 4

UNIT I: FINANCIAL ACCOUNTING 9

Meaning and Scope of Accounting-Principles-Concepts-Conventions-Accounting Standards-Final Accounts-Trail Balance-Trading Account-Profit and Loss Account-Balance Sheet-Funds Flow Analysis-Cash Flow Analysis

UNIT II: ACCOUNTING 9

Meaning-Objectives-Elements of Cost-Cost Sheet-Marginal Costing and Cost Volume Profit Analysis-Break Even Analysis-Applications-Limitations-Standard Costing and Variance Analysis-Material-Labor-Overhead-Sales-Profit Variances

UNIT III: BUDGETS AND BUDGETING CONTROL 9

Budgets and Budgetary Control-Meaning-Types-Sales Budget-Production Budget-Cost of Production Budget-Flexible Budgeting-Cash Budget-Master Budget-Zero Base Budgeting-Computerized Accounting

UNIT IV: INVESTMENT DECISION AND COST OF CAPITAL 9

Objectives and Functions of Financial Management- Capital Budgeting-Methods of Appraisal-Cost of Capital Factors Affecting Cost of Capital-Computation for Each Source of Finance and Weighted Average Cost of Capital

UNIT V: FINANCING DECISION AND WORKING CAPITAL MANAGEMENT 9

Capital Structure-Factors Affecting Capital Structure-Dividend Policy-Types of Dividend Policy-Concepts of Working Capital-Working Capital Policies-Factors affecting Working Capital-Estimation of Working Capital Requirements

L 45 T 15 Total No. of periods: 60

TEXTBOOK

1. S.N.Maheswari, “Financial and Management Accounting”, Sultan Chand & Sons, 2003
2. I.M.Pandey, ”Financial Management”, Vikas Publications, 4th Reprint, 2002

REFERENCES

1. S.P.Iyengar, “Cost and Management Accounting”, Sultan Chand & Co,
2. I.M.Pandey, “Elements of Management Accounting” Vikas Publishing House, 19993

MCA701 PROGRAMMING LABORATORY 0 0 3 1

1. Display the following:
   (i) Floyd's triangle (ii) Pascal Triangle

2. Generate the following series of numbers:
Armstrong numbers between 1 to 100
Prime numbers between 1 to 50
Fibonacci series up to N numbers

3. Manipulate the strings with following operations.
(i) Concatenating two strings (ii) Reversing the string (iii) Finding the substring
(iv) Replacing a string (v) Finding length of the string

4. Find the summation of the following series:
(i) Sine (ii) Cosine (iii) Exponential

5. Create the sales report for M sales person and N products using two dimensional array.

6. Simulate following Banking operations using functions.
(i)Deposit (ii) Withdrawal (iii) Balance Enquiry

7. Implement using recursion
   I, Find the solution of Towers of Hanoi problem using recursion.
   II, Fibonacci number generation.
   III, Factorial

8. Generate Student mark sheets using structures.

9. Create a collection of books using arrays of structures and do the following:
(i) Search a book with title and author name (ii) Sorts the books on title.

Total : 45 Periods

MCA702 DATA STRUCTURES LABORATORY 0 0 6 2

1. Represent the given sparse matrix using one dimensional array and linked list.

2. Create a Stack and do the following operations using arrays and linked lists
   (i)Push (ii) Pop (iii) Peep

3. Create a Queue and do the following operations using arrays and linked lists
   (i)Add (ii) Remove

4. Implement the operations on singly linked list, doubly linked list and circular linked list.

5. Create a binary search tree and do the following traversals
   (i)In-order (ii) Pre order (iii) Post order

6. Implement the following operations on a binary search tree.
   (i) Insert a node (ii) Delete a node

7. Sort the given list of numbers using heap and quick sort.

8. Perform the following operations in a given graph
   (i) Depth first search (ii) Breadth first search

9. Find the shortest path in a given graph using Dijkstra algorithm

Total: 90 Periods

SEMESTER II

MAT509 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE 3 1 0 4

1. MATRIX ALGEBRA 12

Matrices, Rank of Matrix, Consisting of linear system of equations, Eigen values and Eigen vectors of a real matrix, Properties of eigen values and eigen vectors, Cayley Hamilton Theorem(without proof) – Inverse of a Matrix using Cayley Hamilton Theorem.

2. BASIC SET THEORY 12

Basic Definitions - Venn Diagrams and set operations - Laws of set theory - Principle of inclusion and exclusion - partitions- Relations - Properties of relations - Matrices of relations - Functions - injective, surjective and bijective functions.

3. MATHEMATICAL LOGIC 12

Propositions and logical operators - Truth table - Propositions generated by a set, Equivalence and implication - Basic laws - Normal forms - Proofs in Prepositional calculus - Predicate calculus.

4. FORMAL LANGUAGES 12

Languages and Grammars-Phrase Structure Grammar-Classification of Grammars- Ambiquity of grammars - Pumping Lemma For Regular Languages-Context Free Languages.

5. FINITE STATE AUTOMATA 12

Finite State Automata-Deterministic Finite State Automata(DFA), Non Deterministic Finite State Automata (NFA)-Equivalence of DFA and NFA-Equivalence of NFA and Regular Languages.

L 45 T 15 Total No. of Periods: 60

TEXT BOOK

1. M.K.Venkataraman, “Engineering Mathematics”,Volume II, National Publishing Company, 1989.
2. Kenneth H.Rosen,”Discrete Mathematics and its Applications”,Tata McGraw Hill,Fourth Edition , 2002.

REFERENCES

1. Judith L.Gersting, “ Mathematical Structures for Computer Science”, Fifth Edition, W.H. Freeman and Company,NY, 2003.
2. Hopcroft and Ullman, “Introduction to Automata Theory, Languages and Computation”, Narosa Publishing House, Delhi, 2002. (Unit 4,5)
3. Michael Sipser,”Introduction to The Theory of Computation” PWS Publishing Company, Bostan,1997 (Unit 5).
4. J.P. Tremblay and R.Manohar,”Discrete Mathematical Structures with Applications to Computer Science”, TMH, 1997.

MCA506 OBJECT ORIENTED PROGRAMMING 3 0 0 3

1. OOP PARADIGAM 8

Programming Paradigms-Procedural Programming-Modularity-Exception Handling-Data Abstraction-User Defined Types-Concrete Types-Abstract Types-Virtual Functions-Object Oriented Programming-Generic Programming-Containers-Algorithms

2. INTRODUCTION TO C++ 11

Overview of C++-Classes and Objects-Friend Functions-Friend Classes-Inline Function-Static Members-Arrays-Pointers-References-Dynamic Allocation

3. OVERLOADING 8

Function Overloading-Overloading Constructor Functions-Copy Constructors-Default Argument-Operator Overloading-Member Operator Overloading-Overloading new and delete

4. ADDITIONAL FEATURES 9

Inheritance-Base Class-Access Control-Virtual Functions-Pure Virtual Functions-Templates-Generic Functions-Applying Generic Functions-Generic Classes-Exception Handling-C++.

5.INPUT/OUTPUT & STL 9

I/O Streams-File I/O-STL-Overview-Container Classes-Lists-Maps-Algorithms Using Functions and Objects-String Class

Total No. of periods : 45

TEXT BOOKS

1. Bjanne Stroustrup,"The C++ Programming Language",3rd Edition, Addison Wesley, 2000 (Unit 1)

2. Herbert Schildt,"C++ The Complete Reference", Tata McGrawHill Edition, 2003 (unit 2, 3, 4 & 5)

REFERENCES

1. Robert Lafore."Waite Groups OOP in Turbo C++",Galgotia Publications, 2001
2. Stanley, B.Lippman,Jove Lagrie,"C++Primer",3rd Edition, Addison Wesley,1998

MCA507 DESIGN AND ANALYSIS OF ALGORITHMS 3 1 0 4

1. INTRODUCTION 10

Introduction – Notion of Algorithm - Fundamentals of algorithmic problem solving – Understanding the problem-Ascertaining the capabilities of the Computational device-Exact and approximate problem solving-Deciding on appropriate data structures-Method of specifying the algorithm-Proving algorithm correctness -Important problem types –
Fundamental of data structures. Linear data structures – Graphs – Tress – Set and dictionaries.

2. ANALYSIS OF ALGORITHM EFFICIANCY AND GREEDY METHOD 12

Divide Fundamentals of the analysis of algorithm efficiency – analysis frame work – Asymptotic notations – Mathematical analysis for recursive and non-recursive algorithms. Greedy method – Prim's algorithm – Kruskal's algorithm – Dijkstra's algorithm.

3.DIVIDE AND CONQUER 12

Divide and conquer methodology – Merge sort – Quick sort – Binary search – Binary tree traversal – Multiplication of large integers – Strassen's matrix multiplication

4. DYNAMIC PROGRAMMING 12

Computing a binomial coefficient – Warshall's and Floyd' algorithm – Optimal binary search tree – Knapsack problem – Memory functions.

5. BACKTRACKING AND BRANCH AND BOUND 14

Backtracking – N-Queens problem – Hamiltonian circuit problem – Subset sum problem – Branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem.

L 45 T 15 Total No. of periods: 60

TEXT BOOK

1. Anany Levitin "Introduction to the Design and Analysis of Algorithms" Pearson Education 2003.

REFERENCE

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, "Introduction to algorithms" Prentice Hall 1990.

MCA508 DATABASE MANAGEMENT SYSTEMS 3 0 0 3

1. INTRODUCTION 9

Database Systems vs. File Systems-View of Data- Data Models-Database Languages-Transaction Management-Database Systems Structure-History of Database Systems-Database Systems Applications-Entity Relationship Model – Basic concepts- constraints – keys – E R Diagram – weak entity sets – design of an E R Database schema.

2. RELATIONAL DATABASES 9

SQL-Basic Structure-Set Operations-Complex Queries-Joined Queries-DDL-Embedded SQL-Dynamic SQL- -Integrity and Security -Relational Database Design – First normal form – Second normal form – Third normal form - BCNF

3. DATA STORAGE AND INDEXING 9

Storage & File Structure-Disks-RAID-File Organization-Indexing &Hashing-B+ TREE-B Tree-Static Hashing-Dynamic Hashing-Multiple Key Access

4. QUERY EVALUATION & OPTIMIZATION 9

Query Processing-Selection Operation-Sorting-Join Operation-Evaluation of Expressions-Query Optimization – overview – Transformation of relational expressions – choice of evaluation plans.

5. TRANSACTION MANAGEMENT 9

Transaction Concept-Transaction state – implementation of atomicity and durability – Serializability-Concurrency Control-Lock based protocol – time stamp based protocol-Deadlock Handling-Recovery Systems-Failure classification – Log based Recovery-Shadow Paging-Buffer Management-Remote backup systems.

Total No. of periods: 45

TEXT BOOKS:

1. Abraham Silberschatz, Hentry F.Korth and S.Sudharssan,"Database System Concepts", 4th Edition, Tata McGraw Hill, 2002
2. Raghu Ramakrishnan & Johannesgerhrke, "Data Base Management Systems", Mc Graw Hill International Edition, 2000

MCA509 OPERATING SYSTEMS 3 0 0 3

1 INTRODUCTION 7

Definition of OS-Mainframe System-Desktop Systems-Multi processor System-Distributed-Clustered-Real time Systems-Handheld Systems-Operating System Structure-System Components-Services-System Calls-System Programs-System Design and Implementation

2 PROCESS MANAGEMENT 8

Concepts-Process Scheduling-Operations on Processes-Co-operating Processes-Inter Process Communication-CPU Scheduling-Scheduling Concepts-Criteria-Scheduling Algorithms-Multiprocessor Scheduling-Real time Scheduling

3 PROCESS SYNCHRONIZATION 10

Critical Section-Synchronization Hardware-Semaphores-Problems of Synchronization-Critical Regions-Monitors-Deadlocks-Characterization-Handling Deadlocks-Deadlock Prevention-Avoidance-Detection-Deadlock Recovery

4 MEMORY MANAGEMENT 10

Storage Hierarchy-Storage Management Strategies-Contiguous-Non Contigous Storage Allocation-Single User-Fixed Partition-Variable Partition-Swapping-Virtual Memory-Basic Concepts-Multilevel Organization-Block Mapping-Paging-Segmentation-Page Replacement Methods-Locality-Working Sets

5 I/O AND FILE SYSTEMS 10

Disk Scheduling-File Concepts-File System Structure-Access Methods-Directory Structure-Protection-Directory Implementation-Allocation Methods-Free Space Management-Case Study: Linux System

Total No. of Periods: 45

TEXT BOOK

1. Silberschatz and Galvin, Operating System Concepts, 6th Edition, John Wiley & Sons, Inc., 2004

REFERENCES

1. Milankovic M., Operating System Concepts and Design, 2nd Edition, McGraw Hill, 1992
2. P.C.Bhatt, An Introduction to Operating Systems-Concepts and Practice, Prentice Hall Of India, 2004
3. H.M.Deitel, An Introduction to Operating Systems, 2nd Edition, Pearson Education, 2002

MCA703 OBJECT ORIENTED PROGRAMMING LAB 0 0 3 1

1. Programs using Constructor and Destructor.
2. Creation of classes and use of different types of functions.
3. Count the number of objects created for a class using static member function.
4. Write programs using function overloading and operator overloading.
5. Programs using inheritance.
6. Program using friend functions.
7. Program using virtual function.
8. Write a program using exception handling mechanism.
9. Programs using files.
10. Programs using function templates.

MCA704 ALGORITHMS LAB 0 0 3 1

1. Apply the divide and conquer technique to find an element in a given set of elements using binary search method
2. Apply the divide and conquer technique to arrange a set of numbers using quick sort method.
3. Apply the divide and conquer technique to arrange a set of numbers using merge sort method
4. Perform graph traversals
5. Construct a minimum spanning tree using greedy method.
6. Construct optimal binary search trees using dynamic programming method of problem solving.
7. Implement knapsack problem using dynamic programming method
8. Implement N – queen Problem using backtracking method.
9. Implement traveling salesman problem using backtracking method.
10. Implement knapsack problem using branch and bound method.

MCA705 **DBMS Lab** **0 0 3 1**

1. Execute a DDL, DML, DCL and TCL commands for a table.
   (Use necessary constraints during the creation of a table)

2. Execute SQL functions
   (Group, Character, Number, Date and conversion functions)

3. Execute set operators, joins and sub queries.

4. Create and manipulate various DB objects for a table
   (Clusters, synonyms, indexes, sequences)

5. Create views, partitions and locks for a particular DB.

6. Write PL/SQL procedure for an application using exception handling.

7. Write PL/SQL procedure for an application using cursors.

8. Write a DBMS program to prepare reports for an application using functions.

9. Write a PL/SQL block for transaction operations of a typical application using triggers.

10. Write a PL/SQL block for transaction operations of a typical application using package.

11. Design and develop an application using any front end and back end tool (make use of ER diagram and DFD).

Typical Applications – Banking, Electricity Billing, Library Operation, Pay roll, Insurance, Inventory, etc.

SEMESTER – III

MCA510 COMPUTER NETWORKS 3 0 0 3

UNIT I INTRODUCTION 9

Building a network: Requirements **Network Architecture:** – OSI – Internet – **Direct Link Networks**: Hardware building blocks – Framing – Error detection – Reliable transmission.

UNIT II NETWORK FUNDAMENTALS 9

LAN Technology: Ethernet (802.3) – Token Rings (802.5, FDDI) – Wireless (802.11) – Topologies: BUS/Tree – Ring – Star.

UNIT III NETWORK LAYER 9

Packet Switching: Switching and Forwarding – Bridges and LAN switches – **Internetworking:** Simple Internetworking **Routing**: Distance Vector (RIP)- Link state (OSPF)- **Global internet**: Subnetting - Classless Routing (CIDR)- IP version 6 (IPV6).

UNIT IV TRANSPORT LAYER 9

Reliable Byte Stream (TCP) – Simple Demultiplexer (UDP) – TCP Congestion Control – Congestion Avoidance Mechanisms.

UNIT V PRESENTATION LAYER and APPLICATIONS 9

Presentation formatting – Data Compression - **Cryptographic Algorithms:** RSA - DES — **Applications:** Domain Name Service – Electronic Mail (SMTP, MIME) – World Wide Web(HTTP) – Network Management (SNMP).

Total No. of Periods: 45

TEXT BOOKS

1. Larry L. Peterson & Bruce S. Davie, "Computer Networks - A Systems Approach", Harcourt Asia/Morgan Kaufmann, 2000.

REFERENCES

1. James F. Kurose and Keith W. Ross, "Computer Networking - A Top Down Approach featuring the Internet", 1st Edition, Addison Wesley Publishing Company, 2001.
2. William Stallings, "Data and Computer Communications", 5th Edition, PHI, 1997.
3. Andrew S. Tanenbaum, "Computer Networks", Tata Mcgraw Hill, 3rd Edition, 2001

MCA511 MICROPROCESSORS AND APPLICATIONS 3 1 0 4

UNIT I INTRODUCTION TO 8085 MICROPROCESSOR 9

Evolution of the Microprocessor - INTEL 8085- Introduction- Register Architecture - Memory Addressing - 8085 Addressing Modes -8085 Instruction Set -Timing Methods 8085 Pins and Signals -8085 Instruction Timing and Execution.

UNIT II INTRODUCTION TO 8086 MICROPROCESSOR 9

Introduction -8086 Architecture -8086 Addressing Modes -8086 Instruction Set –Data Movement Instructions Arithmetic and Logic Instructions - Program Control Instructions

UNIT III 8086 MICROPROCESSOR INTERFACING 9

System Design Using 8086- Basic System concepts-Bus Cycle - Address and data bus concepts-Interfacing with memories-RAM - EPROM - DRAM - Programmed I/O.

UNIT IV 8086 SYSTEM AND PENTIUM PROCESSOR 9

Interrupts and interrupt service routines- Basic 8086/8088 Configurations: Minimum Mode and Maximum Mode - 8086/8088 based Multiprocessing Systems: Coprocessor Configurations, Closely Coupled Configurations and Loosely Coupled Configuration. Architecture of Pentium processor.

UNIT V PERIPHERAL INTERFACING 9

8255A Programmable Peripheral Interface - IC 8251A Serial Communication Interface – 8253 Programmable Interval Timer IC - IC 8279 Programmable Keyboard /Display Interface – 8259A Programmable Interrupt Controller.

L 45 T 15 Total No. of Periods: 60

TEXT BOOKS

1. Mohamed Rafiquzzaman "Introduction to Microprocessors and Microcomputer- Based System Design" 2nd edition, CRC Press,1995.
2. Yu-cheng Liu, Glenn A.Gibson, "Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design", PHI Second Edition, 2004.

REFERENCES

1. Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", TMH, Third edition, 1999
2. Barry B.Brey,"The INTEL microprocessors 8086/8088, 80186, 80286, 80386 and 80486 Architecture, Programming and Interfacing," Prentice Hall of India, 2001.

MCA512 SOFTWARE ENGINEERING 3 0 0 3

UNIT I INTRODUCTION 9

A Generic View of Process – Process Models-The Waterfall Model-Incremental Model-Evolutionary Model-Specialized Model-The Unified Process–Agile Process Models : Extreme programming (XP) – Adaptive software development - Scrum.

UNIT II REQUIREMENT ANALYSIS 9

System Engineering : Hierarchy of system engineering, Business engineering and Product Engineering – System Modeling – Requirements Engineering (RE) : Tasks- Initiating The RE Process-Eliciting Requirements-Developing Use Cases-Negotiating Requirements-Validating Requirements – Building the Analysis Model: Analysis Modeling Approaches - Data Modeling Concepts – Flow Oriented Modeling.

UNIT III SOFTWARE DESIGN 9

Design Concepts – Design Models – Pattern Based Design – Architectural Design – Component Level Design – Component – Class Based And Conventional Components Design – User Interface Design: The Golden Rules – User Interface Analysis and Design - Interface Design Steps – Design Evaluation.

UNIT IV SOFTWARE TESTING 9

Testing strategies : A Strategic Approach to Software Testing –Test Strategies for Conventional Software – Unit Testing – Integration Testing – Validation Testing – Criteria – Alpha – Beta Testing- System Testing – Recovery – Security – Stress – Performance - Testing Tactics – Testing Fundamentals– White Box testing – Basis Path-Control Structure Testing – Black box testing – Equivalence Partitioning – Boundary value analysis

UNIT V SCM AND QUALITY ASSURANCE 9

Software Configuration Management- SCM Features-SCM Process-Software Quality Concepts – Quality Assurance – Software Review– Formal Technical Reviews – Software Reliability – Quality Standards – Software Quality Assurance Plan

Total No. Of Periods: 45

TEXT BOOK

1. Roger Pressman.S., "Software Engineering: A Practitioner's Approach", 6th Edition, Mcgraw Hill, 2005.

REFERENCES

1. P. Fleeger, "Software Engineering", Prentice Hall, 1999.
2. Carlo Ghezzi, Mehdi Jazayari, Dino Mandrioli, "Fundamentals Of Software Engineering", Prentice Hall Of India 1991.
3. I. Sommerville, "Software Engineering" , 5th Edition: Addison Wesley, 1996

MCA513 COMPUTER GRAPHICS AND MULTIMEDIA SYSTEMS 3 1 0 4

UNIT I INTRODUCTION 9

Overview of Graphics System - DDA - Line Drawing - Bresenham technique – Line Drawing and Circle Drawing Algorithms – Color models – XYZ-RGB-YIQ-CMY-HSV Models

UNIT II 2D TRANSFORMATIONS 9

Two dimensional transformations – Translation, Scaling and Rotations – Reflection –Shearing- The viewing pipeline-Window to view port coordinate transformation.-
Line Clipping – Cohen–Sutherland and Liang-Barsky line clipping - Text Clipping.-Interactive Input methods – Polygon surfaces – Spline representation– Bezier Curves and surfaces

UNIT III 3D TRANSFORMATIONS 9

3D Concepts - Translation, Scaling and Rotations- Projections – Parallel Projection - Perspective Projection – Visible Surface Detection Methods - Polygon rendering methods

UNIT IV OVERVIEW OF MULTIMEDIA 9

Multimedia hardware and software - Components of multimedia – Text – Audio- Images and Graphics – Video and Animation

UNIT V MULTIMEDIA SYSTEMS AND APPLICATIONS 9

Multimedia Data base systems – Synchronization Issues – Presentation requirements – Applications – Video conferencing – Virtual reality – Interactive video – video on demand

L 45 T 15 Total No. of Periods: 60

TEXT BOOKS

1.Hearn D and Baker M.P, "Computer graphics – C Version", 2nd Edition, Pearson Education, 2004(unit 1, 2 &3)
2.Ralf Steinmetz, Klara steinmetz, "Multimedia Computing, Communications and Applications", Pearson education, 2008(unit 4 & 5)

REFERENCES

1. Multimedia: Making It Work, Tay Vaughan, Seventh Edition, Mc Graw Hill 2008.
2. John Villamil, Casanova and Leony Fernanadez, Eliar, "Multimedia Graphics", PHI, 1998.

MCA514 INTERNET PROGRAMMING 3 0 0 3

UNIT I BASIC INTERNET CONCEPTS 8

Connecting to the Internet – Domain Name System - Exchanging E-mail – Sending and Receiving Files - Fighting Spam, Sorting Mail and avoiding e-mail viruses – Chatting and Conferencing on the Internet – Online Chatting - Messaging – Usenet Newsgroup – Internet Relay chat (IRC) – Instant Messaging.

UNIT II WORLD WIDE WEB 8

Overview – Web Security, Privacy, and site-blocking - Creating and Maintaining the Web Sites - Audio and Video on the web pages - File Transfer and downloading – FTP – Peer to Peer – Downloading and Installing software.

UNIT III JAVA FUNDAMENTALS 8

Java features – Java Platform – Java Fundamentals – Expressions, Operators, and Control Structures – Classes, Packages and Interfaces – Exception Handling.

UNIT IV PACKAGES 11

AWT package – Layouts – Containers – Event Package – Event Model – Painting – Garbage Collection - Multithreading – Language Packages.

UNIT V ADVANCED JAVA PROGRAMMING 10

Utility Packages – Input Output Packages – Inner Classes – Java Database Connectivity - Servlets - RMI

Total No. of Periods : 45

TEXT BOOK

1. Margaret Levine Young, "Internet and WWW", 2nd Edition, Tata McGraw Hill, 2002. (Unit 1 & 2)
2. Herbert Schildt, The Complete Reference – Java 2 , 4th Edition, Tata McGraw Hill, 2001. (Unit 3, 4 & 5)

REFERENCES

1. Keyur shah, "Gateway to Java Programmer Sun Certification", Tata Mc Graw Hill 2002.
2. Deitel & Deitel, Java How to Program, Prentice Hall 1999.

MCA706 MICROPROCESSORS LAB 0 0 3 1

1. Write an assembly language program to perform arithmetic operations on block of data using Hexadecimal numbers.

2. Write an assembly language program to perform arithmetic operations on block of data using BCD numbers.

3. Write an assembly language program to perform byte and string manipulation.

4. Write an assembly language program to solve an algebraic equation.

5. Write an assembly language program to sort the array elements using various types.

6. Write an assembly language program for rolling display using keyboard/Display controller.

7. Write an assembly language program to interface Programmable Peripheral Interface.

8. Write an assembly language program to interface Programmable Timer.

9. Write an assembly language program to interface Programmable Communication Interface.

10. Write an assembly language program to recognize a key press using Keyboard Controller.

MCA707 GRAPHICS AND MULTIMEDIA LAB 0 0 3 1

1. Write a program using Fundamental Graphics Functions.
2. Write a program for Line drawing using Bresenham, DDA Line Drawing Algorithms.
3. Write a program for Circle Drawing using Bresenham Circle Drawing Algorithms.
4. Write a program for Line Clipping using any line clipping algorithms.
5. Write a program for 2D Transformations like Translations, Scaling and Rotations.
6. Write a program for generating Bezier curves.
7. Create Frame by Frame Animations using multimedia flash.
8. Develop an advertisement for a product using various techniques like Guide Layer, masking and onion Skin using flash.
9. Create a Jpeg image which demonstrates the various features of an image editing tool using photoshop.
10. Demonstrate Rasterization and filtering of layers and give blending effects for a logo using photoshop.

MCA708 INTERNET PROGRAMMING LAB 0 0 3 1

1. Program to illustrate the use of overloading and overriding.
2. Program to implement the concept of Interfaces and packages.
3. Generate the program using exceptions handling mechanism.
4. Program to achieve Inter thread communication and deadlock avoidance.
5. Implement the file operations like read, write, delete and update.
6. Program using Applets.
7. Program for student mark sheet preparation using JDBC.
8. Program to illustrate the use of Remote Method Invocation.
9. Program for shopping cart using Servlets.
10. Program for user authentication system like user registration form and password checking using Servlets.

SEMESTER IV

MCA515 UNIX AND NETWORK PROGRAMMING 3 0 0 3

UNIT I INTRODUCTION & FILE SYSTEM 9

UNIX System Overview - File I/O - Files and directories - System data files and information: Password file – Group file – Login accounting – system identification.

UNIT II PROCESSES 9

Process Environment – Process control - Process relationships: terminal logins – Network login. **Signals.**

UNIT III INTERPROCESS COMMUNICATION 9

Introduction - Pipes – FIFO – message queues - semaphores –Shared memory.

UNIT IV SOCKETS 9

Introduction – transport layer – **Elementary Socket:** Socket introduction - TCP sockets – UDP sockets - **Socket options:** Generic Socket Options **–** IPV4 Socket Options **- Name and address conversions** (DNS).

UNIT V APPLICATIONS 9

Debugging techniques - TCP echo client server - UDP echo client server - Ping - Trace route - Client server applications like file transfer and chat.

Total No of periods: 45

TEXT BOOKS

1. W.Richard Stevens, Advanced Programming in the UNIX Environment, Addison Wesley, second. (Unit 1,2 &3)

2. W. Stevens, Bill Fenner, Andrew Rudoff, "Unix Network Programming", Volume 1 The Sockets Networking API, 3rd Edition, Pearson education, Nov 2003.(unit 4 & 5)

REFERENCE BOOKS

1.Meeta Gandhi,Tilak Shetty and Rajiv Shah – The 'C' Odyssey Unix –The open Boundless C ,1st Edition ,BPB Publications1992.

MAT510 RESOURCE MANAGEMENT TECHNIQUES 3 1 0 4

UNIT I LINEAR PROGRAMMING MODELS 9

Mathematical Formulation - Graphical Solution of linear programming models – Simplex method – Artificial variable Techniques- Variants of Simplex method

UNIT II TRANSPORTATION AND ASSIGNMENT MODELS 9

Mathematical formulation of transportation problem- Methods for finding initial basic feasible solution – optimum solution - degeneracy – Mathematical formulation of assignment models – Hungarian Algorithm – Variants of the Assignment problem

UNIT III SCHEDULING BY PERT AND CPM 9

Network Construction – Critical Path Method – Project Evaluation and Review Technique – Resource Analysis in Network Scheduling

UNIT IV TIME SERIES 9

Trend – Determination of trend by moving averages, Least square methods, Seasonal Variations – Ratio to moving average method, link relative method some applications.

UNIT V INDEX NUMBERS 9

Construction of Simple index numbers – Unweighted, Weighted index numbers Laspeyres, Paasche, marshal Edge worth index numbers – Some applications.

L 45 T 15 Total No. of Periods: 60

TEXT BOOKS

1. Taha H.A., "Operations Research : An Introduction " 7th Edition, Pearson Education, 2004.
2. G.P. Gupta "Statistical methods S.Chand, 2004.

REFERENCES

1. A.M.Natarajan, P.Balasubramani, A.Tamilarasi, "Operations Research", Pearson Education, Asia, 2005.
2. Prem Kumar Gupta, D.S. Hira, "Operations Research", S.Chand & Company Ltd, New Delhi, 3rd Edition , 2003.
3. Anderson O.D., "Time Series Analysis Theory and Practice" North – Holland, Amsterdam, Elsevier Science Publishers,1985.

MCA516 OBJECT ORIENTED ANALYSIS AND DESIGN 3 1 0 4

UNIT I INTRODUCTION 9

An overview – Object basics – Object state and properties – Behavior – Methods – Messages – Encapsulation and Information hiding – Class hierarchy – Polymorphism – Object Relationships and Associations – Aggregations- Identity – Dynamic binding – Persistence – Metaclasses – Object oriented system development life cycle.

UNIT II METHODOLOGY AND UML 9

Introduction – Survey – Rumbaugh, Booch, Jacobson methods – Patterns – Frameworks – Unified approach – Unified modeling language – Static and Dynamic models – UML diagrams – Class diagram – Use case diagrams – Dynamic modeling – Model management – Extensibility.

UNIT III OBJECT ORIENTED ANALYSIS 9

Identifying Use cases – Business object analysis – Use case driven object oriented analysis – Use case model – Documentation – Classification – Approaches to identifying classes- Identifying object, relationships, attributes, methods: Super-sub class relationships – A-part-of relationships - Aggregation -Identifying attributes and methods – Object responsibility.

UNIT IV OBJECT ORIENTED DESIGN 9

Design process – Axioms – Corollaries – Designing classes – Class visibility – Refining attributes – Methods and protocols – Object storage and object interoperability – Distributed Databases – Object oriented Database Management systems - Object relational systems – Multidatabase systems- Designing Access layer classes- Designing interface objects – Macro and Micro level processes – The purpose of a view layer interface.

UNIT V OBJECT ORIENTED TESTING 9

Quality assurance tests - Testing strategies – Impact of Object orientation testing – Test cases – Test Plan –Usability testing - Guidelines for developing usability testing - User satisfaction tests - Guidelines for developing a user satisfaction test.

L 45 T 15 Total No. of periods : 60

TEXT BOOK

1. Ali Bahrami, "Object Oriented System Development", McGraw Hill International Edition, 1999.

REFERENCES

1. Craig Larman, Applying UML and Patterns, 2nd Edition, Pearson, 2002.
2. Grady Booch, James Rumbaugh, Ivar Jacobson, "The Unified Modeling Language User Guide", Addison Wesley Long man, 1999.
3. Bernd Bruegge, Allen H. Dutoit, Object Oriented Software Engineering using UML, Patterns and Java, Pearson 2004

MCA517 MIDDLEWARE TECHNOLOGIES 3 0 0 3

UNIT I CLIENT / SERVER CONCEPTS 9

Client – Server – File Server, Database server, Group server, Object server, Web server .Middleware – General middleware – Service specific middleware. Client / Server Building blocks – RPC – Messaging – Peer – to- Peer.

UNIT II EJB ARCHITECTURE 9

EJB – EJB Architecture – Overview of EJB software architecture – View of EJB – Conversation – Building and Deploying EJBs – Roles in EJB.

UNIT III EJB APPLICATIONS 9

EJB Session Beans – EJB entity beans – EJB clients – EJB Deployment – Building an application with EJB.

UNIT IV .NET APPLICATIONS 9

Introduction to .NET – Overview of .NET architecture – CLR - Building an application with .NET using component.

UNIT V COM AND CORBA 9

COM – Data types – Interfaces – Proxy and Stub – Marshalling – Implementing Server / Client – CORBA – Distributed Systems – Purpose - Exploring CORBA alternatives – Architecture overview – IDL – ORB - Building an application with CORBA – Comparison COM and CORBA

Total No of periods: 45

TEXT BOOKS

1. Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client/Server Survival Guide", Galgotia Publications Pvt. Ltd., 2002.
2. Tom Valesky,"Enterprise Java Beans",Pearson Education, 2002.
3. Jason Pritchard,"COM and CORBA side by side", Addison Wesley,2000
4. Jesse Liberty, "Programming C#", 2nd Edition, O'Reilly Press, 2002.

REFERNCES

1. Mowbray,"Inside CORBA", Pearson Education, 2002.
2. Jeremy Rosenberger," Teach yourself CORBA in 14 days", Tec media, 2000

MCA711 VISUAL PROGRAMMING LAB 2 0 3 3

1. Program using application wizard :

   SDI, MDI, Drawing Inside the View Window, Device Context

2. Program to handle basic events:

   The message map, saving the view's state, initializing a view class data member

3. Program using graphical device interface objects
4. Program to display modal and modal less dialogs.
5. Program using static and dynamic controls
6. Program using document – view architecture
7. Program with tool bars and status bars
8. Program using SDI and MDI serialization
9. Program to create dynamic link libraries using MFC
10. Program to interface with database

MCA712 UNIX AND NETWORK PROGRAMMING LAB 0 0 3 1

1. Program using basic network commands
2. Program using system calls : create, open, read, write, close, stat, fstat, lseek
3. Program to implement inter process communication using pipes
4. Program to perform inter process communication using message queues
5. Program to perform inter process communication using shared memory
6. Program to perform synchronization using semaphores
7. Program using TCP sockets (Client and Server)
8. Program using UDP sockets (Client and Server)
9. Program to implement File Transfer protocol.
10. Program to implement TCP echo.

MCA713 MIDDLEWARE LAB 0 0 3 1

1. Create a distributed application to download various files from various servers using RMI
2. Develop an Enterprise Java Bean for Basic Arithmetic Operations.
3. Develop an Enterprise Java Bean for Banking operations
4. Develop an Enterprise Java Bean for Library operations
5. Develop an Enterprise Java Bean for User Registration and Login operation.
6. Develop a component for converting the currency values using COM / .NET
7. Develop a component for encryption and decryption using COM / .NET
8. Develop a component for retrieving information from message box using DCOM / .NET
9. Develop a middleware component for retrieving Stock Market Exchange information using CORBA
10. Develop a middleware component for retrieving Weather Forecast information using CORBA

ENG701 COMMUNICATION SKILLS 0 0 2 1

Objectives of the Course:

- To enable students to improve on their communicative skills
- To build capacities to facilitate growth
- To lead students to effective performances in communication
- To sensitize students to their communicative behavior

Unit 1 READING SKILLS: 4Hrs

- Types of Reading
- Tips for Effective Reading – (skimming, scanning, receptive and critical)
- Intensive and Extensive Reading - (learning vocabulary through context.)
- Book Review.

Unit 2 GOOD GROOMING: 2Hrs

- Basic etiquette and Corporate etiquette
- Client Communication
- Group discussion

Unit 3 TELEPHONE ETIQUETTE: 8Hrs

- Nuances of telephonic conversation.
- Leaving a message
- Giving Instructions
- Listening for Tone/Mood and Attitude at the other end (Handling the situations especially trouble shooting. Handling Telephone interviews)

Unit 4 PRESENTATION SKILLS: 6Hrs

- Technical presentation
- Picture presentation
- Extempore
- Presentation using visual aids.

Unit 5 SOFT SKILLS: 10Hrs

- Empathy Building
- Intrapersonal skills
- Interpersonal skills
- Reflective thinking
- Critical thinking
- Negotiation skills (Role play, mock practice, Marketing Skills etc.,) communications)

References:

1. Lesikar.V.Raymond, Pettit.D.John and Flatley.E.Mary – Lesikars Basic Communication: Tata McGraw Hill 8th Edition – 1999.

2. Pauley.E.Stevel, Riordan.G.Daniel – Technical Report Writing Today – AITBS Publishing & Distributors, India 5th Edition – 2000.

Total No. of Periods : 30

SEMESTER V

MCA518 XML AND WEB SERVICES 3 0 0 3

UNIT I INTRODUCTION 9

Role Of XML – XML and The Web – XML Language Basics – SOAP – Web Services – Revolutions Of XML – Service Oriented Architecture (SOA).XML Technology: XML – Name Spaces – Structuring With Schemas and DTD – Presentation Techniques – Transformation – XML Infrastructure.

UNIT II SOAP 9

Overview Of SOAP – HTTP – XML-RPC – SOAP: Protocol – Message Structure – Intermediaries – Actors – Design Patterns And Faults – SOAP With Attachments.

UNIT III XML – CONTENT MANAGEMENT 9

Efficient content Management – File conversion, Component management – Personalized delivery Document Storage & retrieval – storing XML documents – Searching XML documents – Enterprise data Management – Mapping XML to databases – Internet File System.

UNIT IV XML SECURITY 9

Security Overview – Canonicalization – XML Security Framework – XML Encryption – XML Digital Signature – XKMS Structure – Guidelines For Signing XML Documents – XML In Practice.

UNIT V WEB SERVICES 9

Overview – Architecture – Key Technologies - UDDI – WSDL – ebXML – SOAP And Web Services In E-Com.

Total No. Of Periods: 45

TEXT BOOKS:

1. Frank. P. Coyle, XML, Web Services And The Data Revolution, Pearson Education, 2002.
2. Charles F.Goldfarb.Paul Prescod , The XML Hand Book, Third edition, Pearson Education, 2001.

REFERENCES:

1. Ramesh Nagappan , Robert Skoczylas and Rima Patel Sriganesh, " Developing Java Web Services", Wiley Publishing Inc., 2004.
2. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services", Pearson Education, 2004.
3. McGovern, et al., "Java Web Services Architecture", Morgan Kaufmann Publishers,2005.
4. Ed Tittel, "XML for Dummies" , Wiley Publishing .,2002

MCA519 SOFTWARE PROJECT MANAGEMENT 3 0 0 3

UNIT I INTRODUCTION 9

Introduction to competencies - Product development techniques – Project Management skills – Selecting an appropriate life cycle - Software development process and models - The SEI CMM - International Organization for Standardization.

UNIT II DOMAIN PROCESSES AND WORK BREAKDOWN STRUCTURE 9

Managing domain processes - Project selection models - Selecting a project team - Goal and scope of the software project - Project planning - Creating the Work Breakdown Structure(WBS) - Approaches to building a WBS - Project milestones - Work packages - Building a WBS for Software.

UNIT III SOFTWARE ESTIMATION AND ORGANIZATIONAL PLANNING 9

Tasks and Activities - Software size and reuse estimating - Problems and risks in estimation - Cost estimation - Effort measures – COCOMO- A Regression model - COCOMO II – SLIM- A Mathematical model - Organizational planning - Project roles and skills needed.

UNIT IV SCHEDULING ACTIVITIES 9

Resource allocation activities - Organizational form and structure - Software development dependencies - Brainstorming - Scheduling fundamentals - PERT and CPM - Leveling resource assignments - Map the schedule to a real calendar - Critical chain scheduling.

UNIT V RELIABILITY AND RISK MANAGEMENT 9

Software Reliability - Terminology, Fault forecasting, Prevention, Removal, Tolerance – Reliability tools – Software reliability plan - Risk management- models – Identifying risks – Analyzing and quantifying risks - Controlling risks – Risk categories – Steps in risk management plan.

Total No. Of Periods: 45

TEXT BOOK

1. Robert T. Futrell, Donald F. Shafer, Linda I. Safer, "Quality Software Project Management", Pearson Education, Asia, 2002.

REFERENCES

1. Pankaj Jalote, "Software Project Management in Practice", Addison Wesley, 2002.
2. Hughes, "Software Project Management, 3/E", Tata McGraw-Hill, 2004.

1. Create an XML document to store an address book.
2. Create an XML document to store information about books and create the DTD files.
3. Create an XML schema for the book's XML document from exercise 2.
4. Create an XML document to store resumes for a job web site and create the DTD file
5. Present the book's XML document using cascading style sheets (CSS).
6. Write an XSLT program to extract book titles, authors, publications, book rating from the book's XML document and use formatting.
7. Use Microsoft DOM to navigate and extract information from the book's XML document.
8. Write a java program to retrieve data from XML using JAXB and JAXP.
9. Create a web service for temperature conversion with appropriate client program.
10. Create a web service for currency conversion (at five currencies) with appropriate client program.

MCA716 SOFTWARE DEVELOPMENT LAB 0 0 3 1

Develop Software using CASE tools for the applications like :

1. Online railway reservation system
2. Payroll processing application
3. Inventory system
4. Automating the banking process
5. Software for game
6. Library management system
7. Create a dictionary
8. Text editor
9. Telephone directory
10. Create an E-Book of your choice

Software required:

- **Languages**: C/C++/Java/JSDK/Web browser.
- **Any front end tool** (like VB, VC++, Developer 2000) etc
- **Any backend tool** (Oracle, Ms-Access, SQL) etc.
- **Any CASE tool**

ENG702 TECHNICAL WRITING SKILLS 0 0 2 1

OBJECTIVES:

- Acquaint Learners with key Techniques of Technical Writing
- Develop Effective Professional Writing Styles.

Unit I.: FOCUS ON LANGUAGE: 4Hrs.

Basic Grammar – Concord- Impersonal passive voice – Imperatives – Definitions

Unit II: FEATURES OF SCIENTIFIC VOCABULARY: 4Hrs.

Distinctions between ordinary and Technical Writing – Purpose – Importance- Accuracy, Brevity Clarity.

Unit III: WRITING A PARAGRAPH: 8Hrs.

Techniques of Sentence and Paragraph construction- Sequencing of sentences – Editing. (Determination of clarity through fog index)

Unit IV: TRANSCODING GRAPHICS: 10Hrs.

Need for graphics – different types and usage – effective utility.

Unit V: E MAIL COMMUNICATION: **4Hrs.**

E mail Communication – uses – limitations – E mail Etiquette, Folder Management (Filtering flow of e mails).

References:

1. Mitra.K. Barun.- Effective Technical Communications-Oxford University Press, New Delhi. ISBN: 0-19-568296-2
2. Technical Writing- Process and Product (Third Edition)-Gerson. J.Sharon and Gerson.M.Steven.-Pearson Education, Asia, 2001. ISBN 81-7808-381-7.
3. UR. Penny - A University Grammar of English.

Total No. of Periods : 30

ELECTIVES

MCA520 ELECTRONIC COMMERCE 3 0 0 3

UNIT I INTRODUCTION 9

Introduction to Electronic Commerce: Introduction- Electronic Commerce: The second wave- Business Models, Revenue Models, and Business Processes- Economic Forces and Electronic Commerce-Identifying Electronic Commerce Opportunities- International Nature of Electronic Commerce.

The Environment of Electronic Commerce: Legal, Ethical, and Tax Issues: Introduction- The Legal Environment of Electronic Commerce, Use and Protection of Intellectual property in Online Business- Online Crime, Terrorism, and Welfare- ethical Issues – Taxation and Electronic Commerce.

UNIT II COMMERCE ON WEB 9

Selling on the web: Introduction-Revenue Models-revenue Models in transition- Revenue Strategy issues-creating an Effective Web Presence- web Site Usability- Connecting with Customers.

Marketing on the Web: Introduction- Web Marketing Strategies-Communicating with Different Market Segments- Beyond Market Segmentation: Customer Behavior and Relationship Intensity-Advertising on the Web- E-Mail Marketing- Technology-Enabled Customer Relationship Management- Creating and Maintaining Brands on the Web-search Engine Positioning and Domain Names.

UNIT III B2B STRATEGIES 9

Business-to-Business Strategies: Introduction- Purchasing, Logistics, and Support Activities-Electronic Data Interchange- EDI on the Internet- Supply Chain Management using Internet Technologies- Electronic Market places and Portals.

Online Auctions, Virtual Communities, and Web portals: Introduction-Auction Overview-Online Auctions and Related Businesses- Virtual Communities and Web Portals.

UNIT IV SECURITY 9

Electronic Commerce Security: Introduction- Online Security Issues Overview- security for Client Computers- Communication channel Security- security for Server Computers- Organizations that Promote Computer security.

Web Server Hardware and Software: Introduction- Web server Basics- Software for Web Servers- Electronic mail- Web Site and Internet Utility Programs- web Server Hardware.

UNIT V PAYMENT SYSTEMS 9

Payment Systems for Electronic Commerce: Introduction- Online Payment Basics- Payment Cards- Electronic Cash- Electronic wallets- stored-Value Cards- Internet Technologies and the Banking Industry.

Case Study: Two Nationally and Internationally Successful E-Commerce Web Sites.

Total No of Periods: 45

TEXT BOOKS

Gary P.Schneider, "ECOMMERCE: Strategy, Technology and Implementation", India Edition, Cengage Learning India Private Limited, New Delhi, 2007.

REFERENCE BOOKS

1. Kenneth C.Laudon, Carol Guercio Traver , "E-Commerce – Business, Technology, Society", Pearson Education, 2008.
2. Dave Chaffey, "E-Business and E-Commerce Management", 3rd Edition, Pearson Education, 2009
3. Kalakata, Whinston, "Frontiers of electronic commerce", Pearson Education

MCA521 MANAGEMENT INFORMATION SYSTEMS 3 0 0 3

UNIT I SYSTEM CONCEPTS 7

Definition – Computer based user machine system – Integrated system – Need for a database – Utilization of models – Evolution – Subsystems – Organizational subsystems – Activities subsystems.

UNIT II ORGANIZATIONAL STRUCTURE 9

Basic model – Hierarchical – Specialization – Formalization – Centralization – Modifications of basic organizational structure – Project organization – Lateral relations – Matrix organization – Organizational culture and power organizational change

UNIT III STRUCTURE OF MIS 10

Operating elements – Physical components – Processing functions – Outputs – MIS support for decision making – Structured programmable decisions – Unstructured non-programmable decisions – MIS structure based on management activity and organizational functions – Synthesis of MIS structure

UNIT IV SYSTEM SUPPORT 10

Data representation – Communication network – Distributed systems – Logical data concepts – Physical storage devices – File organizations – Data base organization – Transaction processing

UNIT V DEVELOPMENT AND MANAGEMENT 9

A contingency approach to choosing an application – Developing strategy – Lifecycle definition stage – Lifecycle development stage – Lifecycle installation and operation stage – Project management

Total No of periods: 45

TEXT BOOK

1. Gordon B. Davis, Margrethe H. Olson, Management Information Systems: Conceptual foundations, Structure and development –2nd Edition – Tata-Mc Graw hill International book company, 2000

REFERENCES

1. E.Wainright Martin, Carol V. Brown, Danial W. DeHayes, Jeffrey A. Hoffer, William C. Perkins, "Managing Information Technology" 3rd Edition, Prentice Hall International edition 1999.
2. Harold Koontz, Heinz Weihrich, "Essentials of Management", 5th Edition, Tata McGraw Hill 1998.

MCA522 WEB GRAPHICS 3 0 0 3

UNIT I INTRODUCTION 9

HTML : Presentation and layout – Images – Tables - Frames – HTML and Multimedia - Basic web graphics - Web page design and site building - Image maps.

UNIT II PHOTOSHOP 9

Introduction - Image Basics - File Formats - GIF - JPEG - Color Palette - Layers - Creating new Images - Brushes - Grids - Scaling Images - Moving and Merging Layers - Tool Palette - Screen capturing - Grey styling - Using style Palette - Animation.

UNIT III IMAGE HANDLING 9

Scanning Images - Adding Text to the images - Designing icons - Creating background images - Color models - Color depths - Color calibration - Creating gradients - Oil paint effect.

UNIT IV MULTIMEDIA 9

Creating clippings - Animations with sound effects - Adding audio or Video - Windows Media Player ActiveX Control - Agent control - Embedding VRML in a web page - Real Player ActiveX control.

UNIT V ACTION SCRIPTS AND APPLICATIONS 9

Action script Basics – Constructing Action script – Adding interactivity to flash movies - Creating web site with a particular theme using all the utilities like Graphics, Animations and Interaction.

Total No of periods: 45

TEXT BOOKS

1. Richard Schrand, Photoshop 6 Visual Jumpstrat, Adobe Press 2000. (UNIT I,2 & 3)
2. James L. Mohles, Flash 5.0 Graphics, Animation & Interaction, Macromedia 2000. (Unit 4 & 5)

REFERENCES

1. Internet and World Wide Web How to program , Deitel – Prentice Hall 2003
2. Robert Reinhardt, Jon Warren Lentz ,"Flash 5 Bible", Hungry Minds Inc, 2001.

MCA523 HUMAN RESOURCE MANAGEMENT 3 0 0 3

UNIT I LEADERSHIP 9

Technical Leadership - Leader's Goal, Conviction, Vision - Transformational and Transactional Leadership - Leader's Vision - Professionalism : Importance, Elements - Managing Awareness - Performance - Manager's Role in Professionalism – Respect for individual.

UNIT II MANAGING TECHNICAL AND PROFESSIONAL PEOPLE 9

Goals of Engineers and Scientists - Work Assignment – Hierarchy of needs - Need for Influence - Professional Career and Goals - Age and Creativity - Performance - Motivation - Employee Partnership - Career Risks - Technical Competence - Professional Discipline - Manager's Role in Professional Discipline - Guidelines.

UNIT III IDENTIFICATION AND DEVELOPMENT OF TALENTED PEOPLE 9

Talented Professionals – Importance - Characterization - Identification – Assessment and Recognizing Talent - Developing technical talent – Professional development -Development Needs – Career Counseling – Developing managerial talent – Development process – Alternating assignments – Temporary assignments – Management development reviews – Supporting management development.

UNIT IV INNOVATION 9

The Importance of Innovation - Risk of Failure - Nature of Creativity - Imagination - Managing Innovative Teams - Needs of Creative Teams - Team Dynamics - A Software Development Example - Manager's Responsibility - Team's Personal Needs - Political versus Technical Solutions - Team Synergism – Crystallizing the team – Communication – Managing team conflict.

UNIT V TEAM ENVIRONMENT AND RECOGNITION 9

Team structure - Innovative Team Environment -Award Programs - Recognition Programs - An Example Award Plan - Industry Award Plans - Award Guidelines - Incentive Plans - A Caution on Recognition Programs – Case Studies.

Total No. of Periods: 45

TEXT BOOK

1. Watts S. Humphrey, "Managing Technical People: Innovation, Teamwork, and the Software Process", Addison-Wesley, 1996.

REFERENCES

1. Biswajeet Pattanayak, "Human Resource Management", Prentice Hall of India, 2002.
2. K. Aswathappa, Human Resource and Personnel Management text and cases, Tata Mc-Graw Hill publishing Co. Ltd., 2002.

MCA524 ADVANCED DBMS 3 0 0 3

Unit I: Introduction 9

Databases and Database users - Database System concepts and Architecture – Database Administration

Unit II: Database Design Theory and Methodology 9

Functional Dependencies and Normalization for Relational Databases - Relational Database Design Algorithms - Practical Database Design Methodology and Use of UML Diagrams

Unit III: Database Design Issues 9

Algorithms for Query Processing and Optimization - Physical Database Design and Tuning - Database Security

Unit IV: Enhanced Data Models 9

Active Database Concepts and Triggers – Temporal Databases – Deductive Databases - Distributed Databases: Concepts, Database design, Types**.**

Unit V: Emerging Technologies and Applications 9

Web Database Programming using PHP – Overview of Data Mining Technology - Data Warehousing: Introduction, Characteristics - Mobile Databases - Multimedia Databases – Geographic Information Systems – Genome Data Management

Total No. of periods: 45

TEXT BOOK

R. Elmasri and S.B. Navathe, Fundamentals of Database Systems, Pearson Education, Fifth Edition, 2008

REFERENCES

1. Gary W. Hanson and James V. Hanson, Database Management and Design, Prentice Hall of India Pvt Ltd, 1999.
2. Han and Kamber, Data Mining concepts and Techniques, Morgan Kaufmann Publishers, 2nd Edition, 2006
3. Data Base System Concepts, Silberschatz (Abraham); Korth (Henry F); Sudarshan (S), Mcgraw Hill Company Inc., 5th Edition, 2006

MCA525 SOFTWARE QUALITY MANAGEMENT 3 0 0 3

UNIT I INTRODUCTION 9

Software Process assessment overview - Assessment phases - Assessment principles - Assessment conduct -Implementation consideration - Quality management - Quality assurance plan - Considerations – Verification and Validation.

UNIT II CONFIGURATION MANAGEMENT 9

Need for configuration Management - Software product nomenclature - configuration management functions - Baselines - Responsibilities - Need for automated tools - plan – SCM support functions - The requirement phase Design control - The implementation phase - Test phase - SCM Tools - Configuration accounting and audit.

UNIT III SOFTWARE STANDARDS AND INSPECTION 9

Definitions - Reason for software standards - Benefits - Establishing standards - Guidelines - Types of reviews - Inspection of objectives - Basic inspection principles - The conduct of inspection - Inspection training.

UNIT IV TESTING AND MANAGING SOFTWARE QUALITY 9

Testing: principles - Types - Planning - Development - Execution and reporting – Tools and methods - Real Time testing - quality management paradigm - Quality motivation – Measurement criteria - Establishing a software quality program - Estimating software quality.

UNIT V DEFECT PREVENTION 9

Principles of software defect prevention - Process changes for defect prevention - Defect prevention considerations - Managements role - Framework for software process change - Managing resistance to software process change - Case studies.

Total No of periods: 45

TEXT BOOK

1. Watts S. Humphrey, Managing the software process, Addison Wesley, 1999.

REFERENCES

1. Tsum S.Chow, Software Quality Assurance a Practical Approach, IEEE Computer Society press, 1985.
2. Richard E. Fairley, Software Engineering - A Practitioner’s approach, McGraw Hill, 1982.

MCA526 TCP/IP PROTOCOL SUITE 3 0 0 3

UNIT I INTRODUCTION 10

Standards – Internet – History- OSI model – Protocol suite – Addressing – Transmission media – Local Area and Wide Area Networks – Switching – Connecting devices.

UNIT II INTERNET PROTOCOL 10

IP addressing - Subnetting – Supernetting – IP packets – Delivery – Routing – Routing model – Routing table – Datagram – Fragmentation – Checksum – IP Design – ARP – RARP – Internet control message protocol – Internet group management protocol

UNIT III TRANSMISSION CONTROL PROTOCOL 8

User Datagram protocol – UDP operation – Use – UDP design – TCP services – Flow control – Error control – TCP operation and design – connection – Transition diagram – Congestion control

UNIT IV APPLICATION LAYER AND CLIENT SERVER MODEL 8

Concurrency – BOOTP – DHCP – Domain name system – Name space – Distribution – Resolution – Messages – Telnet – Rlogin – Network Virtual Terminal – Character Set – Controlling the server – Remote login

UNIT V APPLICATION PROTOCOLS 9

File Transfer Protocol – Connections – Communication – Simple Mail Transfer Protocol – Simple Network Management Protocol – Hyper Text Transfer Protocol – Transaction – Request and Response messages

Total No of periods: 45

TEXT BOOK

1. Behrouz A. Forouzan, "TCP/IP Protocol Suite", Tata McGraw Hill 3rd Edition.

REFERENCE

1. Douglas E. Comer, David L. Stevens, "Internetworking with TCP/IP – Volume I, II and III", Prentice-Hall of India Pvt. Ltd., 2nd Edition 1994

MCA527 DISTRIBUTED COMPUTING 3 0 0 3

UNIT I INTRODUCTION 9

Characterization of Distributed Systems - Examples - Resource Sharing and the Web - Challenges - System Models - Architectural and Fundamental Models - Networking and Internetworking - Types of Networks - Network Principles - Internet Protocols - Case Studies.

UNIT II PROCESSES AND DISTRIBUTED OBJECTS 9

Interprocess Communication - The API for the Internet Protocols - External Data Representation and Marshalling - Client-Server Communication - Group Communication - Case Study - Distributed Objects and Remote Invocation - Communication Between Distributed Objects - Remote Procedure Call - Events and Notifications - Case Study.

UNIT III OPERATING SYSTEM ISSUES – I 9

The OS Layer - Protection - Processes and Threads - Communication and Invocation – OS Architecture - Security - Overview - Cryptographic Algorithms - Digital Signatures - Cryptography Pragmatics - Case Studies - Distributed File Systems - File Service Architecture - Sun Network File System .

UNIT IV OPERATING SYSTEM ISSUES – II 9

Name Services -Domain Name System - Directory and Discovery Services - Global Name Service - X.500 Directory Service - Clocks, Events and Process States - Synchronizing Physical Clocks - Logical Time And Logical Clocks - Global States - Distributed Debugging - Distributed Mutual Exclusion – Elections – Multicast Communication Related Problems.

UNIT V DISTRIBUTED TRANSACTION PROCESSING 9

Transactions - Nested Transactions - Locks - Optimistic Concurrency Control - Timestamp Ordering - Comparison - Flat and Nested Distributed Transactions - Atomic Commit Protocols - Concurrency Control in Distributed Transactions - Distributed Deadlocks - Transaction Recovery - Overview of Distributed Multimedia Systems

Total No of Periods: 45

TEXT BOOK:

1. George Coulouris, Jean Dollimore and Tim Kindberg, Distributed Systems Concepts and Design, Pearson Education, 3rd Edition, 2002.

REFERENCES:

1. Sape Mullender, Distributed Systems, Addison Wesley, 2nd Edition, 1993.
2. Albert Fleishman, Distributes Systems- Software Design and Implementation, Springer-Verlag, 1994
3. M.L.Liu, Distributed Computing Principles and Applications, Pearson Education, 2004.
4. Andrew S Tanenbaum , Maartenvan Steen,Distibuted Systems –Principles and Pardigms,Pearson Education, 2002
5. Mugesh Singhal,Niranjan G Shivaratri,Advanced Concepts in Operating Systems,Tata McGraw Hill Edition, 2001

MCA528 DATA WAREHOUSING AND DATA MINING 3 0 0 3

UNIT I INTRODUCTION 9

Relation to Databases- Data Mining Functionalities-Steps in Data Mining Process-Architecture of a Typical Data Mining Systems- Classification of Data Mining Systems

UNIT II DATA WAREHOUSING 9

Data Warehousing Components -Multi Dimensional Data Model - Data Warehouse Architecture - Data Warehouse Implementation -Mapping the Data Warehouse to Multiprocessor Architecture- OLAP - Need - Categorization of OLAP Tools.

UNIT III DATA PREPROCESSING AND ASSOCIATION RULES 9

Data Preprocessing-Data Cleaning, Integration, Transformation, Reduction, Discretization and Concept Hierarchy Generation –Method for Data Generalization And Concept Description - Mining Frequent Patterns and Associations: Basic Concepts, Efficient and Scalable Frequent Item set Mining Methods.

UNIT IV PREDICTIVE MODELING 9

Classification and Prediction: Issues Regarding Classification And Prediction-Classification By Decision Tree Induction-Bayesian Classification-Other Classification Methods-Prediction-Clusters Analysis: Types Of Data In Cluster Analysis- Categorization Of Major Clustering Methods: Partitioning Methods –Classical Partitioning Methods: k-Means and k-Medoids.

UNIT V APPLICATIONS 9

Applications of Data Mining-Social Impacts Of Data Mining-Trends in Date Mining -Mining the World Wide Web - Text Mining – Spatial Data Mining.

Total No of Periods: 45

TEXT BOOKS:

1.Jiawei Han, Micheline Kamber, "Data Mining: Concepts and Techniques", 2nd Edition Morgan Kaufmann Publishers, 2006.

REFERENCES:

1. Alex Berson,Stephen J. Smith, “Data Warehousing, Data Mining,& OLAP”, Tata McGraw- Hill, 2004.
2. Usama M.Fayyad, Gregory Piatetsky - Shapiro, Padhrai Smyth And Ramasamy Uthurusamy, "Advances In Knowledge Discovery And Data Mining", The M.I.T Press, 1996.
3. Ralph Kimball, "The Data Warehouse Life Cycle Toolkit", John Wiley & Sons Inc., 1998.
4. Sean Kelly, "Data Warehousing In Action", John Wiley & Sons Inc., 1997.

MCA529 COMPONENT BASED TECHNOLOGIES 3 0 0 3

UNIT I INTRODUCTION 8

Definition - Industrialization of software development - CBD drivers and benefits - Technology evolution - Components and network computing

UNIT II FUNDAMENTALS 10

Basic concepts of CBD - Scenarios for CBD - Evolution or revolution - Build,find and use components and objects.

UNIT III MODELS 10

Basic concepts of object models - Components and interfaces - Working with interfaces - Component and interface modeling - Specification models - domain modeling - Describing classes - Patterns and frameworks.

UNIT IV Using CBD 9

Categorizing & deploying components - CORBA, DCOM.

UNIT V FRAMEWORKS 8

Class libraries - Encapsulated components - Software frameworks - Pre - built applications.

Total No of periods: 45

TEXT BOOKS

1. Kuth Short, Component Based Development and Object Modeling, Sterling software,1997.

REFERENCE:

1. Clemens Szyperski, Component software - Beyond object - Oriented programming, Addison - Wesley, 2000.

MCA530 MOBILE COMPUTING 3 0 0 3

UNIT I INTRODUCTION 9

Medium Access Control : Motivation for Specialized MAC- SDMA- FDMA- TDMA- CDMA- Comparison of Access mechanisms – Tele communications : GSM- DECT- TETRA – UMTS- IMT-200 – Satellite Systems: Basics- Routing- Localization- Handover- Broadcast Systems: Overview – Cyclic Repetition of Data- Digital Audio Broadcasting – Digital Video Broadcasting

UNIT II WIRELESS NETWORKS 9

Wireless LAN: Infrared Vs Radio Transmission – Infrastructure Networks- Ad hoc Networks- IEEE 802.11 – HIPERLAN – Bluetooth- Wireless ATM: Working Group- Services- Reference Model – Functions – Radio Access Layer – Handover- Location Management- Addressing Mobile Quality of Service- Access Point Control Protocol

UNIT III MOBILE NETWORK LAYER 9

Mobile IP : Goals – Assumptions and Requirement – Entities – IP packet Delivery- Agent Advertisement and Discovery – Registration – Tunneling and Encapsulation – Optimization – Reverse Tunneling – IPv6 – DHCP- Ad hoc Networks

UNIT IV MOBILE TRANSPORT LAYER 9

Traditional TCP- Indirect TCP- Snooping TCP- Mobile TCP- Fast retransmit/ Fast Recovery- Transmission/ Timeout Freezing – Selective Retransmission- Transaction Oriented TCP

UNIT V WAP 9

Architecture – Datagram Protocol- Transport Layer Security- Transaction Protocol- Session Protocol- Application Environment-Wireless Telephony Application

Total No of Periods: 45

TEXT BOOKS:

1. J.Schiller, Mobile Communication, Addison Wesley, 2000.

REFERENCE BOOKS:

1.William C.Y.Lee, Mobile Communication Design Fundamentals, John Wiley, 1993.
2.William Stallings, Wireless Communication and Networks, Pearson Education, 2003.
3.Singhal, WAP-Wireless Application Protocol, Pearson Education, 2003.

MCA531 DIGITAL IMAGE PROCESSING 3 0 0 3

UNIT I DIGITAL IMAGE FUNDAMENTALS 9

Digital image processing-introduction - Elements of Visual Perception- Image Sensing & Acquisition- Image Sampling & Quantization- Basic Relationships between Pixels.

UNIT II IMAGE ENHANCEMENT & RESTORATION 9

Histogram Processing - Spatial filtering – Smoothing Spatial Filters – Sharpening Spatial Filters - Frequency domain filtering- Smoothing Frequency Domain Filters – Sharpening Frequency Domain Filters- Image Restoration & Degradation Process – Noise models.

UNIT III IMAGE COMPRESSION & SEGMENTATION 9

Compression Models - Elements of information theory - Error free Compression -Image segmentation –Detection of discontinuities - Edge linking and boundary detection - Thresholding – Region based segmentation - Morphology.

UNIT IV REPRESENTATION AND DESCRIPTION 9

Representation schemes- Boundary descriptors- Regional descriptors - Relational Descriptors

UNIT V OBJECT RECOGNITION 9

Patterns and pattern classes – Recognition based on decision -Theoretic methods - Structural methods.

Case study – Wavelet transforms in one dimension and two dimensions.

Total No. of periods: 45

TEXTBOOK:

1. Gonzalez and Woods, Digital Image Processing, III Ed., Prentice Hall, 2008.

REFERENCES:

1. Anil Jain.K, Fundamentals of Digital image Processing, Prentice Hall of India, 1989.
2. Sid Ahmed, Image Processing, McGraw Hill, New York, 1995.

MCA532 ENTERPRISE RESOURCE PLANNING 3 0 0 3

UNIT I INTRODUCTION TO ERP 9

Integrated Management Information Seamless Integration – Supply Chain Management – Integrated Data Model – Benefits of ERP – Business Engineering and ERP – Definition of Business Engineering – Principle of Business Engineering – Business Engineering with Information Technology.

UNIT II BUSINESS MODELLING FOR ERP 9

Building the Business Model – ERP Implementation – An Overview – Role of Consultant, Vendors and Users, Customisation – Precautions – ERP Post Implementation Options-ERP Implementation Technology –Guidelines for ERP Implementaion.

UNIT III ERP AND THE COMPETITIVE ADVANTAGE 9

ERP domain MPGPRO – IFS/Avalon – Industrial and Financial Systems – Baan IV SAP-Market Dynamics and Dynamic Strategy.

UNIT IV COMMERCIAL ERP PACKAGE 9

Description – Multi-Client Server Solution – Open Technology – User Interface- Application Integration.

UNIT V ARCHITECTURE 9

Basic Architectural Concepts – The System Control Interfaces – Services – Presentation Interface – Database Interface.

Total No. of periods: 45

TEXT BOOK:

1. Vinod Kumar Garg and N.K.Venkita Krishnan, "Enterprise Resource Planning – Concepts and Practice", PHI, 1998.

REFERENCES:

1. Jose Antonio Fernandz, The SAP R/3 Handbook, TMH, 1998.

MCA533 AGENT BASED INTELLIGENT SYSTEMS 3 0 0 3

UNIT I INTRODUCTION 9

Definitions - Foundations - History - Intelligent Agents-Problem Solving- Uniformed Search Strategies – Heuristic Search Strategy -Constraint Satisfaction Problems.

UNIT II KNOWLEDGE REPRESENTATION AND REASONING 9

First order logic-First Order Inference-Unification-Chaining- Resolution Strategies-Knowledge Representation-Objects-Actions-Events

UNIT III PLANNING AGENTS 9

Planning Problem-State Space Search-Partial Order Planning-Graphs-Nondeterministic Domains-Conditional Planning-Continuous Planning-MultiAgent Planning.

UNIT IV AGENTS AND UNCERTAINITY 9

Acting under uncertainty – Probability Notation-Bayes Rule and use - Bayesian Networks-Other Approaches-Time and Uncertainty-Temporal Models- Utility Theory - Decision Network – Complex Decisions.

UNIT V HIGHER LEVEL AGENTS 9

Knowledge in Learning-Relevance Information-Statistical Learning Methods-Reinforcement Learning-Communication-Formal Grammar-Augmented Grammars.
Agent tools-case studies-Free wares.

Total No. of periods: 45

TEXT BOOK:

1. Stuart Russell and Peter Norvig, “Artificial Intelligence - A Modern Approach”,2nd Edition, Prentice Hall, 2002

REFERENCES:

1. Michael Wooldridge, “An Introduction to Multi Agent System”, John Wiley, 2002.

2. Patrick Henry Winston, Artificial Intelligence, 3rd Edition, AW, 1999.

3. Nils.J.Nilsson, Principles of Artificial Intelligence, Narosa Publishing House, 1992.

4. www.agentlands.com

5. www.wareshare.com / free-oracle-Intelligent-agent.

6. www.supershare.com

7. www.Intelligentsystems.com

MCA534 NATURAL LANGUAGE PROCESSING 3 0 0 3

UNIT I INTRODUCTION 9

Speech and Language Processing – Ambiguity – Models and algorithms – Language – Thought – Understanding – Brief history – Regular Expressions – Automata – Morphology and Finite State Transducers – Computational Phonology and Text-to-Speech

UNIT II PROBABILISTIC MODELS AND SPEECH RECOGNITION 10

Spelling – Bayesian method – Weighted Automata – N-grams – Smoothing – Entropy – HMMs and Speech Recognition – Speech Recognition Architecture – Hidden Markov models – Decoding – Acoustic processing – Speech recognizer – Speech synthesis

UNITT III SYNTAX 8

Word classes and Part-of-Speech Tagging – Tagsets – Transformation based tagging – Context free rules and trees – The noun Phrase – Co-ordination – Verb phrase – Finite state and context free grammars – Parsing with context free grammars

UNIT IV UNIFICATION AND PROBALISTIC PARSING 8

Features – Implementing unification – Unification constraints – Probabilistic context free grammars – Problems – Lexicalized context free grammars – Dependency grammars – Human parsing – Language and Complexity

UNIT V SEMANTICS 10

Representing meaning – First order predicate calculus – Semantic analysis – Attachments – Idioms – Compositionality – Robust semantic analysis – Lexical semantics – Selectional restrictions – Machine learning approaches – Dictionary based approaches – Information retrieval

Total No. of Periods: 45

TEXT BOOK

1.Daniel Jurafsky and James H. Martin, " Speech and Language Processing", Pearson Education 2002

REFERENCES:

1. Miechael W. Berry, "Survey of Text Mining: Clustering, Classification and Retrieval Systems", Springer Verlilag, 2003
2. James Allen, "Natural Language Understanding", Benjamin Cummings Publishing Co. 1995

MCA535 SOFTWARE AGENTS 3 0 0 3

UNIT I AGENT AND USER EXPERIENCE 9

Interacting with Agents - Agent From Direct Manipulation to Delegation - Interface Agent Metaphor with Character - Designing Agents - Direct Manipulation versus Agent Path to Predictable

UNIT II AGENTS FOR LEARNING IN INTELLIGENT ASSISTANCE 9

Agents for Information Sharing and Coordination - Agents that Reduce Work Information Overhead - Agents without Programming Language - Life like Computer character - S/W Agents for cooperative Learning - Architecture of Intelligent Agents

UNIT III AGENT COMMUNICATION AND COLLABORATION 9

Overview of Agent Oriented Programming - Agent Communication Language - Agent Based Framework of Interoperability

UNIT IV AGENT ARCHITECTURE 9

Agents for Information Gathering - Open Agent Architecture - Communicative Action for Artificial Agent

UNIT V MOBILE AGENTS 9

Mobile Agent Paradigm - Mobile Agent Concepts -Mobile Agent Technology - Case Study: Tele Script, Agent Tel

Total No. of periods: 45

TEXT BOOKS:

1. Jeffrey M.Bradshaw," Software Agents ", MIT Press, 2000. (UNIT I,2,3 & 4)
2. William R. Cockayne, Michael Zyda, “Mobile Agents", Prentice Hall, 1998 (5th Unit)

REFERENCES

1. Russel & Norvig, " Artificial Intelligence: A Modern Approach ", Prentice Hall, 2nd Edition, 2002

2. Joseph P.Bigus & Jennifer Bigus, “Constructing Intelligent agents with Java: A Programmer's Guide to Smarter Applications ", Wiley, 1997.

MCA536 HEALTH CARE SYSTEMS 3 0 0 3

UNIT I PLANNING AND DEVELOPING AN IT STRATEGY 9

Introduction - Mission of IT in Health Care: Creating a System - Managing the IT Strategic Planning - Process - Strategies in Consulting for the 21st Century - Baylor Health Care - Clarian Health care - Health care Information regulations, laws and standards, Benchmark Developments in U.S. Health Care- American Medical Association (AMA), American Nurses Association (ANA), Health Insurance Portability and Accountability Act (HIPAA)

UNIT II PREPARING FOR ORGANIZATIONAL CHANGE 9

Informatics in Health Care: Managing Organizational Change - The Role of Ethics in IT Decisions - Cases in Redesign - Memorial Hermann Healthcare System: Redesign and Implementation of a Multifacility - Clinical Information System - UPMC Health System.

UNIT III TRANSFORMATION 9

IT: Transition Fundamentals in Care Transformation -The Role of the CIO - Northwestern Memorial Hospital, Chicago: Patients First from the Ground Up - The Jewish Home and Hospital Lifecare System - NYC. – Security of Health care information systems.

UNIT IV PATIENT-CENTERED TECHNOLOGIES 9

Patient Outcomes of Health Care - Six Sigma Excellence - Electronic Health Record - Interviewing Patients with a Computer - Nursing Administration: A Growing Role in Systems Development - Computer-Enhanced Radiology - Information Technology and the New Culture of Patient Safety - A Component Based Clinical Information and Electronic Health Record

UNIT V OUTLOOK ON FUTURE TECHNOLOGIES 9

Technologies in Progress - Evidence-Based Medicine - Aligning Process and Technology - Clinical Decision Support Systems - Quality Information and Care - Role for Health Information Systems - Clinical Practice - Connecting the Community for Better Health, America's Health Insurance Systems

Total No. of Periods: 45

TEXT BOOK

1. Ball, Marion; Weaver, Charlotte A.; Kiel, Joan M. (Eds.) ,"Healthcare Information Management Systems Cases, Strategies, and Solutions Series: Health Informatics", 3rd ed., Springer Berlin Heidelberg New York, 2004

REFERENCES

1. Karen A. Wager, Frances Wickham Lee, John P. Glaser, "Managing Health Care Information Systems: A Practical Approach for Health Care Executives, Jossey-Bass, 2005
2. Rudi Van De Velde and Patrice Degoulet, "Clinical Information Sytems: A Component based approach", Springer 2005.
3. Health Care USA: Understanding Its Organization and Delivery, 6th Edition Harry Sultz, DDS, MPH, Kristina Young, MS, Jones & Bartlett, April 2008

WEBSITES

www.jcaho.org
www.ncqa.org
www.cms.gov
www.aoa-net.org
www.carf.org
www.aaahc.org
www.hl7.org
www.hhs.gov/healthit
www.astm.org

MCA537 UNIX INTERNALS 3 0 0 3

UNIT I INTRODUCTION TO UNIX 9

Unix operating system - History - System structure –Users Perspective- OS Services- Hardware- Architecture- System Concepts- Kernel data structures – System Administration – Buffer Cache- Headers – Structure of the Buffer Pool- Scenarios-Reading and writing Disk Blocks-Advantages & disadvantages of the Buffer cache**.**

UNIT II FILE SYSTEMS 9

INODES - Structure of a regular file- Directories – Conversion of a path name to an INODE - Super Block- INODE assignment – Disk Blocks- System calls for the file system

UNIT III PROCESSES 9

Process States and Transitions – Layout of System Memory – Context of a Process – Manipulation of the process address space – Sleep – Process Control – Creation – Signals – Awaiting process termination – The Shell – System Boot and Init Process – Process Scheduling and Time – System calls for time – Clock.

UNIT IV MEMORY MANAGEMENT 9

Swapping – Demand Paging – Driver Interfaces – Disk Drivers – Terminal Drivers - Streams.

UNIT V INTERPROCESS COMMUNICATION 9

Process Tracing – System V IPC – Network Communications - Sockets – Problem of Multiprocessor Systems – Solution with Master and Slave Processors – Semaphores – Distributed Unix Systems – Satellite Processors – Newcastle connection – Transparent distributed file systems – System Calls.

Total No. of periods: 45

TEXT BOOKS

1. Bach M.J, The Design of the Unix Operating System, Prentice Hall India, 2009.

REFERENCES

1. Goodheart B., Cox.J., The Magic Garden Explained, Prentice Hall India, 1994.
2. Leffler S.J., Mckusick M.K., Karels M.J and Quarterman J.S., The Design and Implementation of the 4.3 BSD Unix Operating System. Addison Wesley, 1998.

MCA538 BUSINESS INTELLIGENCE 3 0 0 3

UNIT I The Need for Business Intelligence 9

The Information Asset – Exploiting Information-Business Intelligence and program success-Business Intelligence – Actionable knowledge – The value of Business intelligence: The Information Asset and data valuation – Business Intelligence applications- The intelligence dashboard.

UNIT II Planning for success 9

Initiating a program – Business/information technology partnership- Business Intelligence success factors- Team building – Strategic versus Tactical planning. The Business Intelligence Environment-the business intelligence process- system Infrastructure- information access, delivery and analysis-services- Management Issues.

UNIT III Business Models and Information flow 9

The Business case- Information processing and Information Flow – Information flow model- Usage In Practice- Modeling Frameworks- Management Issues- Data Models, Data mart, Data warehouse, Online Analytical Processing, Metadata- Business Rules- Sources of Business Rules.

UNIT IV Data Profiling 9

Data Profiling Activities – Data Quality and Information Compliance- Data cleansing- Business Rule- Based Information Compliance – Information Integration-ETL Extract, Transform, Load, Enterprise Application Integration and Web services- Parallelism and Granularity – Alternate Information Contexts- Psychographics and demographics, Geographic data and Web Behaviour Intelligence.

UNIT V Data Enhancement and Knowledge Discovery 9

Types of Data Enhancement- Standardization- Enhancement methodologies – Knowledge Discovery and Data Mining –Data warehouse- Six basic task of data mining – Using publicly available data-data resources- Semi structured data – The Myth of privacy.

Total No. of periods: 45

Text Book

1.David Loshin “Business Intelligence” the savvy Manager’s Guide, Morgan Kaufmann Professionals , 2003.

References

1. Larissa T.Moss, Shaku Atre, “Business Intelligence Roadmap: The complete project Life cycle for Decision Support Applications” Addison Wesley, 2003.

MCA539 MANAGERIAL ECONOMICS 3 0 0 3

UNIT I INTRODUCTION TO MANAGERIAL ECONOMICS 9

Managerial Economics – meaning, nature and scope – Managerial Economics and business decision making – Role of Managerial Economist – Fundamental concepts of Managerial Economics. Demand Analysis – meaning, determinants and types of demand – Elasticity of demand -Estimation of the Demand Function.

UNIT II SUPPLY, PRODUCTION AND COST ANALYSIS 9

Supply – meaning and determinants – Supply Function-Meaning of production – Production analysis: long run and short run – production functions – Isoquants -Expansion path – Cobb-Douglas function. Cost concepts – cost – output relationship: long run and short run – Economies and diseconomies of scale – cost functions – estimation of cost function.

UNIT III MARKET STRUCTURE AND PRICE DETERMINATION 9

Market structure – Perfect Competition – Monopoly – Monopolistic Competition – Oligopoly - characteristics - Pricing and output decisions – Price Discrimination – Price Determinants –methods of pricing – Government intervention and pricing.

UNIT IV PROFIT AND INVESTMENT ANALYSIS 9

Profit - Meaning and nature – Profit policies – profit planning and forecasting –Cost volume profit analysis – Investment analysis – Meaning and Significance – Time Value of money – cash flow and measures of investment worth –payback period criterion – average rate of return criterion – net present value criterion – internal rate of return criterion

UNIT V MACROECONOMIC ISSUE 9

National Income –concepts –determination of national income - Business cycle – Inflation and Deflation –types of inflation – causes of inflation- Balance of payments – account- Monetary and Fiscal Policies – problems of monetary policies – nature of fiscal policy- effectiveness of fiscal policy.

Total No. of periods: 45

TEXT BOOK

1. G.S. Gupta , " Managerial Economics", Tata McGrawhill, 1990.
2. P.L. Mehta "Managerial Economics – Analysis, Problems and Cases" Sultan chand & Sons, 2008

REFERENCES

1. Joel Dean, " Managerial Economics", Prentice Hall India. 1987
2. Evan J. Douglas, "Managerial Economics", Prentice Hall International, 1987.

MCA540 SUPPLY CHAIN MANAGEMENT 3 0 0 3

UNIT I INTRODUCTION TO SUPPLY CHAIN MANAGEMENT 9

What is supply chain – Objectives-Decision Phase in a Supply chain – process view –cycle view-push/pull view –supply chain macro Processes in a Firm-Importance of supply chain flows-Competitive and supply chain strategies – achieving strategic fit- Product Life cycle.

UNIT II DESIGNING THE SUPPLY CHAIN NETWORK. 9

Designing the distribution network – Role of distribution – Factors influencing distribution – Design options – E-business and its impact – Distribution Networks in practice – Network design in the supply chain – Role of network – Factors affecting the network design decisions – Modeling for supply chain.

UNIT III TRANSPORTATION NETWORKS 9

Role of transportation - Modes and their performance - Transportation-Infrastructure and policies - Design options and their trade-offs - Tailored transportation- Routing and scheduling in Transportation- Transportation decisions.

UNIT IV INFORMATION TECHNOLOGY AND THE SUPPLY CHAIN 9

Role of IT in the supply chain – IT Frame work – Customer Relationship Management – Internal Supply Chain Management – Supplier Relationship Management- Transaction Management Foundation – Future of IT in supply chain – Supply chain IT in practice.

UNIT V E-BUSINESS AND THE SUPPLY CHAIN 9

Role of E- Business in supply chain – The E-Business Frame work- B2B additions to the E-Business Frame work- Transaction costs- Improved Market Efficiencies – Supply chain benefits - E Business in practice.

Total No. of periods: 45

TEXT BOOKS

1. Sunil chopra & Peter Meindi, " Supply chain Management Strategy, Planning and Operatio", Pearson Education, 2005.

REFERENCE BOOKS

1. B.S.Sahay, "Supply chain management for global competitiveness", Macmillan India Limited, 2000.
2. David Simchi-Levi, "Designing and managing the supply chain", Tata McGraw-Hill Editions, New Delhi, 2000

MCA541 PORTFOLIO MANAGEMENT 3 0 0 3

UNIT I MONEY AND CAPITAL MARKETS 8

Trends of savings and financial flow, the Indian Money market, introduction, characteristics of money market , need for money market, major segments of money market, money market instruments and Capital market, introduction, primary market and secondary market, recent capital market reforms, new capital issue, instruments and market participant

UNIT II STOCK EXCHANGES 10

Nature and functions of stock exchange in India,organizational structure of the secondary marlet,stock exchanges and financial development in India, listing of securities in stock exchange-OTCEI market-New Issue Market- concepts and function, underwriting, role of new issue market ,mechanics of trading in stock exchanges.

UNIT III FUNDAMENTAL ANALYSIS 8

Economic Analysis - Economic forecasting and stock Investment Decisions - Forecasting techniques. Industry Analysis - Industry classifications. Economy and Indus try Analysis. Industry life cycle - Evaluating Industry relevant factors - External industry information sources. Company Analysis : Measuring Earnings - Forecasting Earnings - Applied valuation techniques - Graham and Dodds investor ratios.

UNIT IV TECHNICAL ANALYSIS 10

Technical Analysis: Fundamental Analysis Vs Technical Analysis - Charting methods - Market Indicators. Trend - Trend reversals - Patterns - Moving Average - Exponential moving Average - Oscillators - ROC - Momentum - MACD - RSI - Stoastics.Factors influencing share prices, forecasting stock prices - Efficient Market Theory - Risk and Returns.

UNIT V PORTFOLIO ANALYSIS 9

Portfolio theory- Markowitz theory, Sharpe index model,CAPM.Portfolio investment model- basic principles, planning, implementation, portfolio objective and types. Portfolio evaluation – measures of return, formula plans,types of formula plans.Risk adjusted measure of performance – Sharpe's measure, Treynor's measure and Jensen's measure

Total No. of periods: 45

TEXT BOOKS:

V.K.Bhalla, "Investment Management", S.Chand & Company Ltd, New Delhi 2003.

REFERENCES:

1. Punithavathy Pandian, Security Analysis & Portfolio Management – Vikas Publishing House Pvt. Ltd., 2001.
2. V.A.Avadhani – Securities Analysis & Portfolio Management – Himalay Publishing House, 1997.

MAT511 NUMERICAL METHODS 3 1 0 4

UNIT I SOLUTION OF EQUATIONS AND EIGEN VALUE PROBLEMS 9

Linear interpolation methods (method of false position) – Newton's method –iteration method – Solution of linear system by Gaussian elimination and Gauss-Jordon methods- Iterative methods: Gauss Jacobi and Gauss-Seidel methods - Inverse of matrix by Gauss-Jordan method - Eigen value of a matrix by power method.

UNIT II INTERPOLATION 9

Forming the difference table, operators E and Δ; relationship between the operators. Newton's forward and backward difference formulae – central difference formula ; Gauss forward and backward formula ; Equidistant arguments with one or two missing entries.

UNIT III INTERPOLATION WITH UNEQUAL INTERVALS 9

Divided difference table; Newton's divided difference formula. Lagrange's formula, inverse Interpolation – simple problems

UNIT IV NUMERICAL DIFFERENTIATION AND INTEGRATION 9

Numerical differentiation: Derivatives by using Newton's forward , backward and divided differences – Numerical integration - trapezoidal and Simpson's 1/3 and 3/8 rules – Weddle's rule.

UNIT V INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS 9

Single step methods: Taylor series method – Euler and improved Euler methods – Fourth order Runge – Kutta method for solving first and second order equations – Multistep methods: Milne's and Adam's predictor and corrector methods.

L 45 T 15 Total No. of Periods: 60

TEXT BOOK:

1. M.K.Venataraman, "Numerical Methods in Science and Engineering", The National Publishing Company. May 2003.

REFERENCES

1. Gerald, C.F, and Wheatley, P.O, "Applied Numerical Analysis", Sixth Edition, Pearson Education Asia, New Delhi, 2002.
2. Sastry, S.S, " Introductory Methods of Numerical Analysis", Third Edition, Prentice – Hall of India Pvt Ltd, New Delhi, 2003.

MAT512 STATISTICS METHODS 3 1 0 4

UNIT I STATISTICAL MEASURES 9

Measures of central tendency: Mean, Median and Mode – Measures of variation – Range, standard deviation, Mean deviation and coefficient of var iation.
Correlation and Regression: Karl Pearson's coefficient of correlation – Rank Correlation – Regression lines.

UNIT II PROBABILITY AND STANDARD DISTRIBUTIONS 9

Elements of probability Random variable - Moments - Moment generating functions and their properties- Statement of Binomial, Poisson, Geometric, Uniform, Exponential and Normal distributions and their properties.

UNIT III FITTING OF DISTRIBUTINOS, CURVES AND SIMULATION 9

Fitting of Binomial, Poisson and Normal distributions- Simulating samples form Binomial, Poisson, Normal and Exponential distributions Fitting of curves: Straight line - Parabola – Exponential smoothing

UNIT IV SAMPLING 9

Simple Random sampling – without replacement- Stratified random sampling – Systematic sampling- simple problems

UNIT V MULTIVARIATE ANALYSIS 9

Design of Experiments: Randomization- Replication – Local control- Completely Randomized Block Design- Randomized Block Design- Latin Square Design
Discriminant analysis- Distance formula- Mahlanobis D^2

L 45 T 15 Total No. of Periods: 60

TEXT BOOK :

1. Statistics for Business and Economics, 8th Edition. - Anderson, Sweeney and Williams – Thomson South – Western, 2002.
2. Fundamentals of Mathematical Statistics S. C Gupta, V.K. Kapoor, 11th Edition, Sultan chand and Sons Educational Publishers

REFERENCES:

1. CR. Rao, Linear statistical inference, John Wiley and sons, 1965 .
2. William..G.Cochran, Sampling Techniques Wiley and sons, 1977 .
3. Goon.Guptha , Das.Guptha " Fundamentals of Statistics", Volume I & II.

MCA542 - CLOUD COMPUTING

L T P C 3 0 0 3

UNIT I UNDERSTANDING CLOUD COMPUTING 6

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services

UNIT II DEVELOPING CLOUD SERVICES 10

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds

UNIT III CLOUD COMPUTING FOR EVERYONE 10

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

UNIT IV USING CLOUD SERVICES 10

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing - Collaborating on Databases – Storing and Sharing Files

UNIT V OTHER WAYS TO COLLABORATE ONLINE 9

Collaborating via Web-Based Communication Tools – Evaluating Web Mail Services – Evaluating Web Conference Tools – Collaborating via Social Networks and Groupware – Collaborating via Blogs and Wikis

Total=45

TEXT BOOKS

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

2. Haley Beard, Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.

MCA543 - SOFTWARE RELIABILITY AND METRICS

L T P C
3 0 0 3

UNIT I INTRODUCTION TO SOFTWARE RELIABILITY 7

Basic Concepts – Failure and Faults – Environment – Availability –Modeling –uses.

UNIT II SOFTWARE RELIABILITY MODELING 12

Concepts – General Model Characteristic – Historical Development of models – Model Classification scheme – Markovian models – General concepts – General Poisson Type Models – Binomial Type Models – Poisson Type models – Fault reduction factor for Poisson Type models.

UNIT III COMPARISON OF SOFTWARE RELIABILITY MODELS 10

Comparison Criteria – Failure Data – Comparison of Predictive Validity of Model Groups – Recommended Models – Comparison of Time Domains – Calendar Time Modeling – Limiting Resource Concept – Resource Usage model – Resource Utilization – Calendar Time Estimation and confidence Intervals.

UNIT IV FUNDAMENTALS OF MEASUREMENT 8

Measurements in Software Engineering – Scope of Software metrics – Measurements theory – Goal based Framework – Software Measurement Validation.

UNIT V PRODUCT METRICS 8

Measurement of Internet Product Attributes – Size and Structure – External Product Attributes – Measurement of Quality –Reliability Growth Model – Model Evaluation

TOTAL = 45

REFERENCES:

1. John D. Musa, Anthony Iannino, Kazuhira Okumoto, “Software Reliability – Measurement, Prediction, Application, Series in Software Engineering and Technology”, McGraw Hill, 1987.
2. John D. Musa, “Software Reliability Engineering”, Tata McGraw Hill, 1999.
3. Norman E . Fenton, Shari Lawrence Pfleeger, "Software metrics", Second Edition, International Student Edition, 2003.